

Running head: EFFECTS OF DEPLOYMENT ON THE MENTAL HEALTH OF SERVICE  
MEMBERS

Graduate Management Project:

Effects of Deployment on the Mental Health of Service Members at Fort Hood

Carla M. Dickinson

U.S. Army – Baylor University Graduate Program in Health Care Administration

**20071101298**

### Disclaimer

The opinions expressed herein are those of the author and do not reflect the official policies of the U.S. Army Medical Command, Department of the Army, Department of Defense, Baylor University, or the U.S. Government.

### Statement of Ethical Conduct in Research

The author declares no conflicts of interest or financial interests in any product or service mentioned in this article, including grants, employment, stock holdings, gifts, or honoraria. The confidentiality of individual members of the study population was protected at all times throughout the study.

### Acknowledgments

I would like to thank the staff at Carl R. Darnall Army Medical Center for providing inspiration and assisting me in conducting this study. I would also like to thank Dr. Karin W. Zucker and Dr. A. David Mangelsdorff for their help in designing this project.

## Abstract

A factor in the Army's ability to perform its mission is the continuous supply of forces ready for deployment. The impact deployment has on the mental health of service members affects the policy and the resources needed for mental and behavioral health. Deployment health assessments occur throughout the deployment cycle to ensure the health of service members. On 10 March, 2005 a Post-Deployment Health Reassessment, with an emphasis on mental health, was added to the program by a directive from The Assistant Secretary of Defense for Health Affairs. The need exists for establishing a baseline to help implement appropriate policy, to improve treatment, and to quantify the resources needed for mental health. The objective of this research is to determine if a significant correlation exists between deployment and the outcome of a provider assessment for mental health. Data collected from the Post-Deployment Health Reassessment (DD Form 2900) were used to compare three deployment groups: never deployed ( $n=167$ ), deployed once ( $n=1,498$ ), and deployed more than once ( $n=566$ ). Comparisons were made with regard to the mental health screening dimensions of relationship problem, PTSD, alcohol problem, depression, anger problem, and suicidal ideation. Statistical analysis confirms that a significant difference exists for relationship problem  $F(2, 2228) = 3.79, p = .02$  and PTSD  $F(2, 2228) = 3.65, p = .03$ .



## TABLE OF CONTENTS

DISCLOSURE .....	2
ACKNOWLEDGMENTS .....	3
ABSTRACT .....	4
TABLE OF CONTENTS .....	5
LIST OF TABLES .....	7
LIST OF FIGURES .....	8
1. INTRODUCTION .....	9
Deployment Health Program Development .....	9
VA Programs .....	9
Department of Defense Programs .....	10
Deployment Health Program .....	11
Conditions Prompting the Study .....	13
Statement of the Problem .....	16
2. LITERATURE REVIEW .....	17
Historical Studies .....	17
Risk Factors for Psychological Reactions .....	27
Studies of Current Operations .....	30
Purpose .....	36
3. METHOD AND PROCEDURES .....	37
Participants .....	38
Apparatus .....	39
Procedure .....	46

## TABLE OF CONTENTS continued

Data Analysis .....	52
4. RESULTS .....	55
Demographics .....	55
Descriptive Statistics.....	57
Soldiers' Survey.....	57
Provider Assessment.....	60
Reliability.....	61
Correlations.....	62
Analysis of Variance.....	66
5. DISCUSSION .....	68
6. CONCLUSION.....	73
7. RECOMMENDATION .....	74
8. APPENDICES .....	76
A. Post-deployment Health Reassessment Survey DD Form 2900.....	76
B. Provider Interview Instructions.....	80
C. Variables, Measures, and Coding of Data.....	82
9. REFERENCES .....	84

## LIST OF TABLES

1. Demographic Characteristics .....	39
2. Frequency and Percent of Deployment Group Characteristics .....	56
3. Soldiers' Survey across Deployment Groups .....	59
4. Provider Assessment across Deployment Groups .....	61
5. Correlations for Demographics and Soldiers' Survey across Deployment Groups.....	64
6. Correlations for Soldiers' Survey and Provider Assessment across Deployment Groups .....	66
7. Summary Statistics and Comparison of Deployment Groups: ANOVA .....	67

## LIST OF FIGURES

1. Fort Hood Post-deployment Health Reassessment Concept of Operation. ....	47
2. Fort Hood Post-deployment Health Reassessment (PDHRA) Setup at Abrams Gymnasium..	50
3. Fort Hood Post-deployment Health Reassessment Process for Referral .....	52

## Introduction

### *Deployment Health Program Development*

Health concerns among veterans of the Persian Gulf War prompted the Department of Veterans Affairs and the Department of Defense to begin systematic programs for the evaluation and management of service members' health after deployment. The Department of Veterans Affairs had two related programs: the (1) Persian Gulf Registry and the (2) Uniform Case Assessment Protocol. The Department of Defense calls its program the Comprehensive Clinical Evaluation Program (Post-Deployment Health Evaluation and Management Clinical Practice Guideline, 2001). From these early programs the current deployment health program evolved (Deployment Health Clinical Center, 2005).

### *Department of Veterans Affairs Programs*

The Department of Veterans Affairs developed the Persian Gulf Registry, opened in November 1992, to assist in addressing questions about the health concerns of Gulf War veterans. The registry grouped medical information of war veterans together in order to analyze data and perform epidemiological studies. To be included in the registry a veteran had to self-enroll and had to have served in the Persian Gulf War. Veterans who enrolled in the registry were offered a complete physical examination, basic laboratory studies, and referrals for specialty consultation. Additionally, a complete medical history was obtained and documented in every participating veteran's medical record (Post-Deployment Health Evaluation and Management Clinical Practice Guideline, 2001).

The Uniform Case Assessment Protocol was designed to provide guidance to the physicians responsible for administering the registry examination. The protocol consisted of two phases: Phase I required registry physicians to (a) obtain a detailed medical history, including



information on exposure to environmental and biochemical hazards; (b) conduct a physical examination; and (c) order basic laboratory tests. Phase II was initiated for veterans who displayed symptoms that were undiagnosed after phase I. It included additional laboratory tests, medical consultations, and symptom-specific tests. Veterans who did not receive a diagnosis after phase II were sent to one of the four Veterans Healthcare Administration referral centers for additional testing and evaluation. At the completion of these examinations, veterans received personal counseling about their test results. Once diagnosed, veterans were referred to primary care teams for treatment (Post-Deployment Health Evaluation and Management Clinical Practice Guideline, 2001).

#### *Department of Defense Program*

The Department of Defense initiated a similar program, the Comprehensive Clinical Evaluation Program. Service members self-enrolled in the program by calling a toll-free number. The program created a centralized source of information about the numbers and the kinds of problems experienced by those who had Gulf War symptoms and to track their care. However, the process had flaws- the responsibility was given to the individual patient to know that there was such a number, to find out the number, and to take the time to call the number to get his or her name on the list for an evaluation (Deployment Health Clinical Center, 2005).

After a veteran enrolled, the Comprehensive Clinical Evaluation Program used a process of intensive evaluations by medical specialists to identify Gulf War health problems for treatment. This practice had the advantage of using a "no stone unturned" method of evaluation. However, it also had disadvantages. It separated care for deployment related symptoms from other health care concerns the veteran had, creating a fragmented approach to health care (Deployment Health Clinical Center, 2005).

*Deployment Health Program*

From 1997 through 1999, the Institute of Medicine conducted reviews of the Department of Veterans Affairs and Department of Defense post-war health initiatives. The Institute of Medicine recommended that rather than naming a special deployment-specific registry, veterans should receive evaluation and care as needed in the primary care setting, using evidenced-based clinical practice guidelines. The Institute of Medicine emphasized the post-deployment period as a crucial time for carrying out medical evaluations and providing appropriate care for returning service members, based on the experiences encountered after the Vietnam and Gulf Wars. Additionally, Department of Defense and Veterans Health Administration clinicians identified the need for standardized guidelines for assessing, evaluating, and treating service members who may have deployment related health concerns (Post-Deployment Health Evaluation and Management Clinical Practice Guideline, 2001).

The improvement of deployment-related health programs occurred in both clinical and policy arenas. In a joint effort the Department of Defense and Veterans Health Administration developed the Clinical Practice Guideline for Post-Deployment Health Evaluation and Management (Post-Deployment Health Evaluation and Management Clinical Practice Guideline, 2001). In addition to the clinical practice guideline, policies and procedures for deployment-related healthcare were updated (Joint Chiefs of Staff Memorandum, 2002, MCM-006-02) and implemented (Under Secretary of Defense Memorandum, 2003; Assistant Secretary of Defense for Health Affairs Memorandum, 2001, HA Policy 01-017; Assistant Secretary of Defense for Health Affairs Memorandum, 1999, HA Policy 99-002; Assistant Secretary of Defense for Health Affairs Memorandum, 2002).



The purpose of the post-deployment health guideline is to strengthen the capacity to provide effective military health care for patients with post-deployment health concerns and to place responsibility for this care in the hands of primary care providers. The guideline has three basic components: screening, classification, and management. Physicians determine through the screening process whether use of the post-deployment health clinical practice guideline is appropriate. Screening occurs before deployment, after deployment, and during outpatient clinic visits to identify whether health concerns for those visits are deployment-related. A patient identified as appropriate for treatment using the post-deployment health guideline is classified into one of three categories based on the deployment-related concern: (a) being asymptomatic but with a health concern, (b) having an identifiable diagnosis (e.g., poison ivy rash), or (c) having medically unexplained physical symptoms. Management of the patient is outlined according to the type of problem identified (Farley & Vernez, 2002; Post-Deployment Health Evaluation and Management Clinical Practice Guideline, 2001). Clinical support and resources for the post-deployment health guideline are maintained at the Department of Defense Deployment Health Clinical Center at Walter Reed Army Medical Center (Assistant Secretary of Defense for Health Affairs Memorandum, Jan 14, 2002).

The processes specified in the guideline for identifying and treating post-deployment health patients were designed for enhancing clinical care. Ensuring the screening of service members and collecting valid and reliable data are separate but related issues. The collection of epidemiological data for deployment-related health is outlined in the February 2002 memorandum, "Updated Procedures for Deployment Health Surveillance and Readiness" by the Office of the Chairman of the Joint Chiefs of Staff (MCM-0006-02). This memorandum updated the procedures for deployment health surveillance and readiness to include requiring a pre- and



post-deployment health assessment (MCM-0006-02). The health assessments are maintained in the individual medical record and are sent to the Army Medical Surveillance Activity for integration into the Defense Medical Surveillance System deployment health data repository. Epidemiological data collected during the deployment cycle (before, during, and after deployment) are stored in this data repository (Under Secretary of Defense Memorandum, 2003; Joint Chiefs of Staff Memorandum, 2002, MCM-006-02; Assistant Secretary of Defense for Health Affairs Memorandum, 1999, HA Policy 99-002; Assistant Secretary of Defense for Health Affairs Memorandum, 2002, HA Policy 99-002).

Although deployment-related healthcare is a complex program, it has been simplified through the integration of clinical practice guidelines and policy. The policies provide guidance for implementing the conceptual framework for optimizing health of the service member, screening the service member, and the collection of epidemiological data (Joint Chiefs of Staff Memorandum, 2002, MCM-0006-02). Through these policies, service members are introduced into the military health care system. Deployment-related healthcare is a continuously evolving program that has become more proactive in the identification of health care needs and the restoration of health of service members.

#### *Conditions that Prompted the Study*

The Assistant Secretary of Defense for Health Affairs, Dr. William Winkenwerder, Jr., directed the extension of the then current Department of Defense Deployment Health Program in a memorandum dated 10 March, 2005 (HA Policy 05-011), pursuant to research (Bliese, Wright, Adler, & Thomas, 2004; Hoge et al., 2004) indicating that health concerns are more frequently identified several months following deployment. This directive resulted in the Post-Deployment Health Reassessment (PDHRA) Program in addition to the pre-deployment health assessment

and post-deployment health assessment. It includes a reassessment of global health, with an emphasis on mental health, and is to be completed 90-180 days after returning from deployment.

On 1 August 2005, the Assistant Secretary of the Army for Manpower and Reserve Affairs selected Fort Hood as a PDHRA test site to help determine the planning factors for resources, assess the PDHRA instrument, determine referral rates, ascertain treatment requirements, and establish a time line in preparation for Army-wide implementation. On 18 August, 2005 Fort Hood began the PDHRA as a pilot site for program implementation. The events leading up to the Fort Hood PDHRA implementation are summarized in the following paragraphs.

Given its mission and proactive response to the well being of redeploying forces, Fort Hood was primed for PDHRA implementation. It has approximately 46,000 active duty personnel and a major mission to mobilize and demobilize Army Reserve and National Guard troops. Additionally, Fort Hood had approximately 14,000 service members returning from deployment that fell into the 90-180 day window for program implementation.

In October 2004, Darnall Army Community Hospital began to expand mental health services to meet the expected increase in post-deployment counseling needs at Fort Hood. With this expansion, the Fort Hood Resilience and Restoration Center was opened; behavioral health specialists of Darnall Army Community Hospital, III Corps, and the Department of Veterans Affairs combined to treat and counsel service members, and conduct research. Simultaneously, the Great Plains Regional Medical Command spearheaded the Behavioral Health Summit to identify projected requirements regarding the readiness of service members redeploying to Fort Hood. The purpose of this meeting was to develop a template for the identification, assessment,



and necessary means of behavioral intervention in support of the fighting force and their families.

As a follow-up to the Behavioral Health Summit, The Surgeon General of the Army directed a second summit, which was held in April 2005. The purpose of this summit was to further develop the Great Plains Regional Medical Command template for behavioral health and institute the concept of “resetting the force.”<sup>1</sup>

This concept, from a medical perspective, involves resolving medical and behavioral health concerns of the fighting force to improve readiness for future deployment. The Army Surgeon General promotes a resetting the force concept built in three phases: decompression, reintegration, and “readiness reset.” The decompression phase occurs over time as stressors of deployment are relieved. As part of the reintegration process, redeploying service members are briefed on what stressors to expect on homecoming, the common symptoms of post-deployment stress, ways to ameliorate these symptoms, how to recognize when further professional help is needed, and how to access treatment services. Readiness reset occurs with health assessments and treatment. Service members returning home complete the Post-Deployment Health Assessment, which screens for post traumatic stress disorder and other deployment-related stresses, concerns about family issues, and concerns about drug and alcohol abuse. A primary-care provider then may refer service members to on-site counselors or mental-health departments of military treatment facilities if needed. Additionally, service members complete a post-deployment health reassessment between 3 and 6 months after redeployment in order to detect conditions that are not immediately apparent.

---

<sup>1</sup> The Army resets the force by preparing redeploying service members and their equipment for future missions. It rebuilds combat power through a series of actions to restore units to a desired level of combat capability commensurate with mission requirements and availability of resources. This is accomplished by reorganizing returning units, retraining, providing professional development, adjusting supplies and equipment to support the force, and bringing unit readiness back to Army standards (Army Posture Statement, 2005).

In June 2005, the Forces Command Commanding General was briefed on The Surgeon General's resetting the force concept. The Forces Command Commanding General directed the Surgeon General to integrate resetting the force with "Army Force Generation," a structured progression of increased unit readiness over time, scheduled to be implemented in March 2006. It provides a framework for a continuous steady supply of forces ready for deployment with more predictable unit rotation schedules. It consists of three phases: reset-train, ready, and available. These phases are based on the objective cyclic rotation rates of active and reserve component forces as defined in the July 9, 2003 Secretary of Defense Memorandum: One operational deployment in 3 years for the active component, and one operational deployment in 6 years for the reserve component (Army Posture Statement, 2006).

The reset-train phase occurs when units redeploy from operations, recover, reorganize, stabilize, receive new equipment, and train. It is during this phase that The Surgeon General's resetting the force concept is integrated into Army Force Generation. This phase allows service members returning from deployment to have a period of stabilization and medical rehabilitation before the next deployment. During the ready phase units plan and prepare for operations and may deploy, if needed. Units in the available phase are in their assigned time period for deployment (Army Posture Statement, 2006).

#### *Statement of the Problem or Question*

The concepts of resetting the force and Army Force Generation assume that post-deployment health can be fully restored through a process of medical rehabilitation and a period of stabilization. It assumes that service member resilience, the ability to adapt well to changes and events, is a result of a preventative maintenance methodology to deployment health. However, this approach may not account for the baseline mental health status of the Army or the



long term effect of deployment on mental health. If the assumptions of “Resetting the Force” and Army Force Generation are correct, it is likely that the deployed population is most at risk and that health can be restored to a “functional level”.<sup>2</sup>

The percentage of service members who are not restored to a functional level of health may have an adverse effect on the Army’s ability to maintain force readiness over time. A continuous degradation of the supply of forces ready for deployment may result in an Army-at-risk. An Army-at-risk versus a population-at-risk affects policy and resources needed for mental and behavioral health. For an Army-at-risk, the integration of mental and behavioral health services may need to begin at the point of entry into the military. Furthermore, resources must be increased based on the military force and not on deployment alone. Is this an Army-at-risk or a population-at-risk?

### Literature Review

Militaries have been impacted by operational stress throughout history. Examples of the effect of combat on individuals and armies are well documented. This literature review focuses on three major categories: historical studies of service members (psychological reactions to combat and lessons learned); risk factors for psychological reactions (individual, unit, and battlefield stressors); and studies of current operations (Afghanistan and Iraq).

#### *Historical Studies of Service members*

To study the effect of combat on service members it is useful to conduct an historical review of the psychosocial impact of combat. This section will provide an historical overview of the manifestations of combat stress reaction and the lessons learned from previous wars. Combat

---

<sup>2</sup> A “functional level” is defined by the World Organization of Family Doctors as the level of actual performance or capacity to perform, both in the sense of self-care or being able to fulfill a task or role at a given moment or during a given period. It refers to the ability of a person to cope with and adapt to the changing elements in his or her individual environment and to perform certain tasks to a measurable degree (Van Weel et al., 1995).

stress reaction is the current term used to describe physiological, behavioral, and psychosocial reactions experienced before, during, or after combat.

Combat stress reactions identified during the U.S. Civil War manifested with reports of panic in the midst of battle, “nostalgia,” “soldier’s heart,” and desertion. Nostalgia was characterized by feelings of homesickness, explosive aggression, disciplinary problems, social isolation, flat affect, and mistrust of command. It generally occurred among young service members and when service members were away from home for long periods of time. Soldier’s heart was characterized by a prolonged elevated heart rate, overwhelming fatigue, and difficulty breathing. From 1861 to 1865, the Union Army officially recognized 2,600 cases of “insanity,” 5,200 cases of nostalgia, and 200,000 deserters (Jones, Sparacino, Wilcox, Rothberg, & Stokes, 1995). In 1862, Surgeon General William A. Hammond recommended a minimum age of 20 years old for recruits to screen out those prone to nostalgia. The implementation of this recommendation did not have the desired impact on reducing the number of insanity and nostalgia cases or the number of deserters. Hammond later recognized the importance of unit cohesion in the prevention of combat stress reactions (Jones et al., 1995; Helmus & Glenn, 2005).

During World War I, the term “shell shock” was used to describe combat stress reaction. Service members presented with dramatic symptoms (paralysis, blindness, and amnesia) along with more subtle symptoms such as headache, sleeplessness, depression, and anxiety. It was thought that artillery shells and explosives caused microhemorrhages in the brain. However, this theory was discredited by: (a) the manifestation of shell shock in service members not exposed to explosives and, (b) the observation of service members with head injuries who did not develop the symptoms. Consequently, the diagnostic term was changed to “war neurosis;” yet shell shock



remained part of the nomenclature of the service member (Jones et al., 1995; Helmus & Glenn, 2005).

Treatment of combat stress evolved throughout the war. Initially service members were evacuated to base hospitals or to England. French and British physicians noticed that service members treated geographically proximate to the battle field improved more rapidly than those who were evacuated. In 1917, when the United States was preparing to enter the war, Thomas Salmon used the British and French experiences to develop a program for the prevention and treatment of combat stress. Salmon's program involved placing psychiatrists in the combat divisions with forward hospitals to support them. He recommended that American stress casualties be treated close to the front (proximity), shortly after evacuation (immediacy), and with the expectation that they return to duty (expectancy). This treatment was later described as "forward psychiatry" and is still used in combat medicine. The return to duty rate for hospitals closest to the battle field was reported to be as high as 80%, while divisional hospitals reported 65% (Jones et al., 1995). Although there were advances in treatment during World War I, the cost of caring for service members after the war remained a concern. Approximately \$42 million was paid to psychiatrically-afflicted veterans in 1940 (Jones et al., 1995; Helmus & Glenn, 2005).

In 1942, the United States entered World War II and implemented a screening program in an attempt to limit psychiatric losses. Potential recruits were rejected from service for educational deficiencies, assertions of anxiety disorders, or neurotic personalities. As a result, approximately 1,600,000 recruits were denied military service for psychological or educational deficiencies (a disqualification rate approximately 7.6 times higher than in World War I) (Jones et al., 1995; Helmus & Glenn, 2005). Screening out potential psychiatric casualties proved

ineffective. Separation rates for psychiatric disorders were 2.4 times as high in World War II as in World War I (Jones et al., 1995). The screening program was recognized as a failure when large numbers of psychiatric casualties occurred during fighting in North Africa (Jones et al., 1995; Helmus & Glenn, 2005).

In 1943, the program of forward psychiatry devised in World War I was reinvigorated. General Omar Bradley issued a directive which established a holding period of 7 days for psychiatric patients and which ordered the use of the term “exhaustion” as the initial diagnosis for psychiatric patients. This term conveyed the least implication of mental disorder and the directive aligned with the principles of forward psychiatry; proximity, immediacy, and expectancy (Jones et al., 1995; Helmus & Glenn, 2005).

Psychiatrists further studied combat stress reaction during WWII to include the influence of unit cohesion, intensity of combat, experience, combat length, and periods of increased risk. They found that units with good morale and leadership had fewer combat stress casualties than those without these attributes, when variables such as combat intensity were comparable. The intensity of combat, measured by the killed-in-action or wounded-in-action rates, was an important factor. Intense battles contributed to an increase in combat stress casualties. The level of anxiety was noted to increase at different stages in a combat tour. Inexperienced service members were more likely to experience a high level of stress than experienced service members, and the inexperienced service members accounted for over three fourths of stress casualties. However, a service member exposed to combat for a long period of time was also likely to become a stress casualty. Service members who experienced combat stress after 4 to 5 months of combat returned to duty in 70% to 89 % of cases; those exposed to combat for more than a year returned to duty in 32% to 36 % of cases. Finally, periods of increased risk for stress



were noted during pre-deployment, pre-combat, combat, and post combat (Jones et al., 1995; Helmus & Glenn, 2005).

In the early months of the Korean Conflict, combat stress casualties were high, and forward psychiatric treatment was absent. Colonel Albert Glass, a psychiatrist, was sent to Korea as a consultant to establish forward psychiatric treatment and to employ the lessons learned from previous conflicts. He further refined forward psychiatry by establishing a three-echelon system of care. The first echelon, located with the service members, consisted of a psychiatrist, psychologist, social worker, and enlisted personnel who treated combat stress and provided education on its prevention. Additionally, mobile mental health units were created to supplement care during periods of heavy fighting. The second echelon was the field hospital; the third echelon was a hospital in Japan or the U.S. (Jones et al., 1995; Helmus & Glenn, 2005).

To reduce stress, a rotation system and a rest and recreation period were implemented. Service members returned to the U.S. after 9 months in direct combat or 13 months in support units. Experience during the Korean Conflict revealed that forward psychiatry could result in the return to battle of up to 90% of combat stress casualties. However, there was a failure to recognize the psychological impact of deployment on service members who were supporting combat units. The stressors of these service members were related to separation from home and friends, social and physical deprivations, and boredom. Their stress manifested in drug and alcohol abuse and behavioral problems (Jones et al., 1995; Helmus & Glenn, 2005).

Combat psychiatry further evolved during the Vietnam Conflict. From the beginning of the conflict, psychiatric programs were in place and resourced with providers trained in combat psychiatry. However, the manifestation of combat stress reactions was different from that of previous conflicts. A low rate of combat stress was noted until the withdrawal period (1973-

1975). Furthermore, the rate of combat stress reaction did not fluctuate with the rate of wounded-in-action or killed-in-action as it did in previous conflicts. There seemed to be an inverse relationship: when combat operations declined in 1970, psychiatric casualties increased and peaked in 1973. This was different from previous conflicts in which psychiatric casualties increased with combat intensity. Helmus & Glenn (2005) list the 12-month rotation policy, fewer enemy engagements, the rapid evacuation of wounded, and rotations back to base camps after combat as possible explanations for the differences in rates of battle stress. The *Leaders Manual for Combat Stress Control* (Field Manual No. 22-51, 1994) includes the sporadic nature of fighting, the U.S. air and artillery superiority, well-supplied fire bases, scheduled rest and recuperation, and a fixed combat tour as reasons for the low rates of combat stress reaction. Most battle fatigue cases were at levels which could be treated within the unit and did not require medical holding or hospitalization (Jones et al., 1995; Helmus & Glenn, 2005; Field Manual No. 22-51, 1994).

While the service member rotation program may have reduced the number of psychiatric casualties, it is also credited with creating problems in unit cohesion and combat effectiveness. Rotations occurred on an individual basis; people rotated in and out of units, limiting the extent to which bonds of cohesion developed and solidified. Stress manifested in misconduct. Serious incidents of poor discipline occurred, including the commission of atrocities at My Lai in March 1968, combat refusal, and the murder of leaders. Psychiatric cases, including drug and alcohol addiction became epidemic when combat operations declined in 1970-1971. By September 1971, psychiatric cases accounted for over 60% of all medical evacuations from Vietnam. Today those misconduct problems are recognized as having contributed to the high incidence of delayed post-traumatic stress disorder (PTSD) in Vietnam veterans (Field Manual No. 22-51, 1994). The most



lasting contributions of the conflict to the history of battle trauma are the recognition of misconduct as a manifestation of stress and the legacy of PTSD. After the conflict, many veterans began to report problems such as apathy, depression, mistrust, insomnia, and nightmares (Jones et al., 1995; Helmus & Glenn, 2005; Field Manual No. 22-51, 1994).

The Israeli Wars also provide insight to battle stress. In the 1973 battle with Egypt (Yom Kippur War), the stress casualty-to-wounded ratio was 30:100 (Jones et al., 1995; Helmus & Glenn, 2005). Combat lasted 4 weeks across a highly mobile battlefield, without forward psychiatry. The Israelis counted on the high cohesion and training of their troops and leaders to keep stress casualties to a minimum. Their estimates of stress casualties suggest that large numbers of Israeli service members, including veterans and leaders, became unable to function solely because of stress. Since the Israeli Defense Force had no plans for treatment and return to duty, all such cases were evacuated to hospitals in Israel. True to the experiences of WWI and WWII, many of these Israeli service members who were evacuated remain psychiatrically-disabled today (Jones et al., 1995; Helmus & Glenn, 2005).

After the Yom Kippur War, the Israelis instituted a program of leadership training and medical and mental health support based on the U.S. Army model. This was intended to prevent combat stress casualties and to treat those cases which occurred in the brigade and division support areas. However, in the 1982 Lebanon War, many individuals with combat stress were inadvertently evacuated by helicopter to Israel in the initial haste of the invasion. Few of these service members returned to full duty, while 60% to 80% of those treated in Lebanon did (Jones et al., 1995; Helmus & Glenn, 2005; Field Manual No. 22-51, 1994). These battles renewed the U.S. Army Medical Department's interest in forward psychiatry, stimulating an increase in the

number of trained personnel and positioning these personnel in combat units (Jones et al., 1995; Helmus & Glenn, 2005; Field Manual No. 22-51, 1994).

In David Marlowe's publication, *Psychological and Psychosocial Consequences of Combat and Deployment with Special Emphasis on the Gulf War* (2001), he views the physical and psychological response to combat and deployment stress within a complex system of individual differences and cultural influence. He argues that the relationship between stress and physical and psychological symptoms is complex and is not attributable to a single cause. He believes that stress may have a role in some of the undiagnosed illnesses among Persian Gulf War veterans because physical and psychological responses interact with each other, serving as both cause and effect.

Marlowe incorporates individual differences and cultural influences into his explanation. Individual differences cause two service members exposed to the same combat situation to react differently- one service member may view an event as positive, while another views it as negative. These influences help form the responses of service members (positive or negative, physical illness, PTSD) and may lead physicians to view a disease process in a certain manner (as having a single cause and treatment). Marlowe states that long term consequences of combat stress can arise from several factors. It can be the stress or preparation for deployment, the boredom of waiting for action, the frustration of close quarters, the burnout of 24 hour operations for 7 days a week, the anxiety of not knowing who is the enemy and never being out of their reach, the shock of seeing and handling human remains, or the stress of reintegrating at home after deployment is over (Marlowe, 2001).

Before and during Operation Desert Storm, the public had doubts about the military and its weapons systems. The media portrayed the American force as vulnerable and inexperienced.



In contrast, the Iraqi force was portrayed as nearly invincible, cohesive, well led, highly trained, and technically advanced. Additionally, Iraq was known to have nerve and gas agents along with the capacity and will to use them. The quality and effectiveness of protective equipment (gas masks and chemical suites) and detection equipment of the U.S. military were reported to be inadequate. Marlowe (2001) found that interviews with soldiers revealed a continuous concern about the effects of chemical warfare, the expertise of the Iraqi Army, and the ability of the U.S. equipment to protect U.S. service members (Marlowe, 2001).

The Iowa Persian Gulf Study Group (1997) studied a sample of the 28,968 Iowans from the National Guard, Reserve, or active component who were on active duty during the Gulf War. A stratified random sample selected 4,886 subjects of whom 3,695 (76%) completed a structured telephone interview. Participants were asked about symptoms, health status, and exposures during the Persian Gulf War. Compared to those who did not deploy, personnel deployed to the Gulf War reported significantly higher prevalence rates of symptoms of depression, PTSD, chronic fatigue, cognitive dysfunction, bronchitis, asthma, fibromyalgia, alcohol abuse, anxiety, and sexual discomfort. The self-reported exposure to chemicals and biological weapons were significantly related to many of the medical and psychiatric conditions experienced. Personnel who served in Iraq, Saudi Arabia, or Kuwait were significantly associated with depression, cognitive dysfunction, and fibromyalgia, compared with those who were stationed elsewhere in the theater (Iowa Persian Gulf Study Group, 1997).

The process by which service members returned from combat may have influenced his or her ability to mentally transition between peace and war. Kirkland (1995) in his writing on *Postcombat Reentry*, discusses the effect of social support on reintegration into the post-war world. He grouped conflicts into three categories: major wars, limited wars, and rapid

deployment operations. Between 1775 and 1992, the United States Armed Forces were involved in seven major wars, more than 30 limited conflicts, and hundreds of military operations.

Following the major wars (the Revolutionary War, the War of 1812, the Mexican War, the Civil War, the Spanish-American War, World War I, and World War II) service members were generally released from military service and returned home. Therefore, post-deployment issues were a societal, not a military problem. Except in World War II, military units stayed together during the journey home. This provided an opportunity to decompress by mentally processing experiences together, reassuring one another, and validating behavior and feelings. The service members of World War II trained, deployed, and fought together, but experienced a different return. Although the war had public support, problems with morale and discipline occurred. Kirkland (1995) attributed this to the processes of returning home, release from service, and transition to civilian life. He concluded that the point system “by which each service member could earn points for time in the service, time overseas, time in combat, wounds, and decoration” (Kirkland, 1995, p. 295) created an isolated individual by separating service members from their comrades to return alone. He further concluded that the lack of social support contributed to the inability to decompress, resulting in acting out feelings of helplessness and frustration (Kirkland, 1995).

Korea and Vietnam were the largest limited conflicts; others were Grenada, Panama, the Persian Gulf War, Somalia, and Haiti. These conflicts were characterized by intense, brief battles. The level of popular support and the number of forces deployed varied. Conflicts before 1973 were supported by conscription; those after 1980 were supported by an all volunteer, professional force. Service members left combat in Korea and Vietnam as individuals and not with their units, resembling the return from World War II. Kirkland (1995) concluded this



resulted in the lack of a support system for service members to validate and legitimize their experiences. Coupled with the lack of public support, service members developed difficulties with the transition from combat to civilian life. Because these service members left military service after return, post-deployment issues were mainly a societal concern (Kirkland, 1995).

Limited conflicts, characterized by rapid deployment and short duration, are categorized as “rapid deployment operations.” These campaigns provoked specific types of stress reactions in some service members and most units reported some difficulty in adjusting from combat to the mundane routines of training. Service members were well trained and they served in cohesive units. The range of mental health issues fell into three categories: acute reactions to combat, post combat validation, and reintegration into the postwar world. Acute reactions to combat included emotions such as distress over killing; a complex mix of grief, guilt, and rage over losing comrades; and generalized patterns of anxiety, irritability, and nightmares. Kirkland (1995) states that reintegration after short wars has three characteristics that distinguish it from the processes associated with reintegration after long wars. First, the intense emotional experience of combat had not been blunted by time and the erection of defenses, making the letdown from war to peace more intense. Second, service members who remain on active duty after combat lose the sense of personal significance and potency associated with a real world mission and do not have it replaced by a qualitative change in identity from service member to civilian. Third, there is no perception that the job is done, the misery is over, and there is an end to terror.

#### *Risk Factors for Psychological Reactions*

A complex mix of factors determines an individual’s reaction to combat, resulting in difficulty identifying, predicting, and preventing debilitating psychological reactions. For simplicity, the literature (Gal & Jones, 1995; Helmus & Glenn, 2005) divides the cause of

combat stress reactions into three categories: individual factors, unit factors, and battlefield factors. Individual factors include non-military stress, prior combat exposure, and role in combat. Unit factors consist of morale and combat assignment. Battlefield factors include anticipation, combat intensity, and physical hardship.

Non-military stressors such as marriage, pregnancy of a spouse, and the birth of a child seem to have an impact on combat stress reactions. In the Yom Kippur War, these stressors were linked to combat stress reactions; 80% of Israeli service members with combat stress reaction reported either prior or ongoing civilian stressors such as a pregnant spouse or birth of a new child in the past year, a recent death of a loved one, a recent marriage, a new mortgage, or sick parents. Marital status and major life events were not linked to acute stress reactions in the Lebanon War; they were related to the development of PTSD (Gal & Jones, 1995; Helmus & Glenn, 2005).

Unit factors including morale and combat assignment have been linked to combat stress reactions. Helmus & Glenn (2005, p. 26) define morale as “a general sense of well-being enjoyed by the military unit.” They attribute three factors to morale: self-confidence, trust in command, and unit cohesion. Helmus & Glenn (2005) cited an example from a World War II study. The study compared disease rates to the self reported ratings of service members for three categories (a) willingness for combat, (b) confidence in combat stamina, and (c) confidence in combat skills. It found combat units that reported the lowest levels of confidence experienced a disease and non-battle injury rate that was almost twice that of companies reporting a high self-confidence level. Trust in command has been related to stress levels and psychiatric breakdown in the 1973 Israeli-Arab War and in the Persian Gulf War. Soldiers with combat stress reaction or PTSD type symptoms reported leadership problems or a lack of faith in command. Unit



cohesion was found to be one of the most important factors and one of the psychiatric lessons learned from World War II. Combat assignment has impacted combat stress casualty rates in previous conflicts. In World War II, service members assigned to combat units had a higher percentage of psychiatric admissions. During more recent conflicts, service members of combat support units were found to have a higher percentage of combat stress casualties than service members assigned to combat units. Service members assigned to elite units report low levels of psychiatric casualties (Gal & Jones, 1995; Helmus & Glenn, 2005).

Battlefield contributors to stress include anticipation, combat intensity, and physical hardship. In Vietnam, it was noted that when deployment was uncertain, there was an increase in psychiatric referrals and psychiatric complaints. These referrals and complaints decreased once deployment became definite. Additionally, individuals scheduled for combat reported an increase in vague medical complaints with no identifiable cause (Helmus & Glenn, 2005). After the Gulf War, service members reported the start of the ground war as the greatest stress reliever of the deployment. The intensity of combat and the duration of battle were linked to combat stress during World War II. The number of combat stress casualties was found to rise in proportion to the number of wounded-in-action and killed-in-action. Additionally, rates of combat stress casualties were also correlated to the intensity of combat following the Lebanon War. The intensity of battles was rated prospectively by service members. The ratings were then correlated to documented physical and combat stress causality rates. As the rated intensity of battles increased the physical and combat stress causality rates increased. Physical hardships including hunger, sleep deprivation, and extremes in weather are also combat stressors (Gal & Jones, 1995; Helmus & Glenn, 2005).

The *Marines' Leaders Guide* states that Marines are at risk for combat stress reactions regardless of experience. It defines risk factors as “those things that increase the probability that stress will turn into a serious mental health problem” (United States Marine Corps Leaders Guide to Managing Marines in Distress, 2005, Operational Stress section). It lists the following risk factors as associated with a stress reaction: length of exposure to combat or operational stress, severity of combat or operational stress experience, history of previous traumatic events (war, child sexual abuse, and assault), previous mental health problems, alcohol abuse or dependence, lack of support system or unit cohesion (United States Marine Corps Leaders Guide to Managing Marines in Distress, 2005).

#### *Studies of Current Operations*

Kang & Hyams (2005) suggest that service members returning from combat in Iraq and Afghanistan have more risk factors for developing PTSD than did the populations of the Vietnam War and the 1991 Gulf War. They suggest that mental disorders are found in 26% of the population receiving health care at a VA facility since returning from a deployment in Iraq or Afghanistan, while a prevalence rate of 15% is cited for other veteran populations. The most common diagnoses were adjustment disorders.

This increase in mental health care may represent a true increase or bias. A self-referral bias may have occurred since combat veterans are eligible for 2 years of free health care from the VA for any condition that may be related to combat. This eligibility may lead service members to claim conditions they might not have otherwise claimed. An ascertainment bias may result from the emphasis on evaluating veterans for war-related mental disorders. This occurs when providers document every symptom as a problem even if they would not have done so in a different population (Kang & Hyams 2005).

Initial research about the mental health problems faced by service members in Iraq and Afghanistan demonstrates differences and similarities. Differences include the percentage of service members who screen positive for mental health disorders, the category of service members most affected, and the impact of forward elements of the behavioral healthcare system and quality of life. Similarities include the stigma associated with seeking mental health, types of mental health disorders reported, and screening instruments used (Hoge et al., 2004; Operation Iraqi Freedom Mental Health Advisory Team Report, 2003; Operation Iraqi Freedom Mental Health Advisory Team Report, 2005).

Standardized screening instruments and protocols were used for the following studies and were approved by the institutional review board of the Walter Reed Army Institute of Research (WRAIR). The studies are cross-sectional phases of an ongoing, longitudinal study of the effect of combat on the mental health of service members. They represent a proactive approach to filling the gap in the understanding of the full psychosocial effect of combat. The studies represent data collected before, during, and after combat in Iraq and Afghanistan (Hoge et al., 2004; Operation Iraqi Freedom Mental Health Advisory Team Report, 2003; Operation Iraqi Freedom Mental Health Advisory Team Report, 2005).

Using a survey instrument that included the patient health questionnaire and the 17-item National Center for PTSD Checklist, Hoge et al. (2004) conducted a study of Army combat soldiers and marines immediately before deployment ( $n=2,530$ ) and 3 to 4 months after deployment ( $n=3671$ ). The surveys spanned the timeframe from January 2003 to December 2003. They suggest that as many as 9% of service members may be at risk for mental disorders before deployment and 11% to 17% after deployment. They found a larger percentage of service members with exposure to combat in Iraq met the screening criteria for major depression,



generalized anxiety, or PTSD than did those with exposure to combat in Afghanistan. The percent of those deployed to Iraq whose responses were positive for a mental disorder was 15.7% to 17.1%. Of the service members deployed to Afghanistan, 11.2 % screened positive for a mental disorder. Nine percent of the service members screened positive for mental disorders before deployment to Iraq. Additionally, they found a strong relation between combat experiences and the prevalence of PTSD. The prevalence of PTSD increased with the number of firefights during deployment in both Iraq and Afghanistan. Service members whose responses were positive for a mental disorder were twice as likely as those whose responses were negative to report concern about possible stigmatization and other barriers to seeking mental health care (Hoge et al., 2004).

The Operation Iraqi Freedom Mental Health Advisory Team I, here and after called Team I, was established in July 2003 and conducted a comprehensive assessment of the behavioral healthcare system for deployed service members. Its mission was to assess Operation Iraqi Freedom-related mental health issues and to provide recommendations to the medical and line commands. It focused on the behavioral health services for deployed service members and units, the evacuation of behavioral health patients, the behavioral health services at Fort Stewart, the increase in suicides during July 2003, and the suicide prevention program. It found the forward elements of the Operation Iraqi Freedom behavioral healthcare system demonstrated great effectiveness in helping service members deal with the combat and operational stressors, benefiting both the individual service member and the unit. Recommendations included steps to immediately improve the behavioral health care system through communication, coordination of services, training, and systematic assessment after arrival at home station (Operation Iraqi Freedom Mental Health Advisory Team Report, 2003).

A service members treated near his or her unit avoided the stigma linked to evacuation for a behavioral health illness and had a 95% return to duty rate. Almost half of the service members surveyed reported not knowing how to obtain services; and of those service members wanting help, only one-third had received assistance. Forward-deployed behavioral health units reported greater dissatisfaction with the availability of psychotropic medications than units located in the rear. Team I found a need for (a) improvement in the consistency of implementation of behavioral health services across the theater, and (b) a standardized behavioral health reporting and documentation system (Operation Iraqi Freedom Mental Health Advisory Team Report, 2003).

Team I surveyed the health and well being of, and conducted focus groups with, 756 U.S. Army service members in Kuwait and Iraq between 27 August and 30 September 2003. The survey was administered to them during their 6<sup>th</sup> or 7<sup>th</sup> month in theater. Of this population, 82% had engaged in combat. The team found that 77% of surveyed service members reported no stress or mild stress, emotional problems, or family problems, 16% reported moderate levels, and 7% reported severe levels. Of the surveyed service members 7.3% screened positive for anxiety, 6.9% for depression, and 15.2% for traumatic stress. Additionally, 52% reported low or very low personal morale, and 72% reported low or very low unit morale (Operation Iraqi Freedom Mental Health Advisory Team Report, 2003). Service members who expressed a desire to receive help with mental health problems perceived barriers consistent with the findings of Hoge et al. (2004).

Problems with behavioral health services after evacuation were also noted. Of the service members who left Iraq for behavioral health reasons, very few (11% of those evacuated to Kuwait, and 3.5% of those evacuated to Germany) returned to duty. Of the 49 service members



evacuated to Fort Stewart, 16% failed to receive follow-up care and 76% received six or fewer follow-up visits. Medical records were inconsistently maintained, and documentation did not reliably accompany patients through the evacuation chain (Operation Iraqi Freedom Mental Health Advisory Team Report, 2003).

The suicide rate of 15.6 per 100,000 service members deployed to Operation Iraqi Freedom during the January-October 2003 timeframe was higher than recent Army historical rates of 11.9 per 100,000 service members (Operation Iraqi Freedom Mental Health Advisory Team Report, 2003). Additionally, there was a higher incidence of suicides during July relative to other months in 2003. Suicide rates were higher for service members located in Iraq than in Kuwait; rates for members of the active component were higher than rates for members of the reserve component; and rates during this month were higher for both males and females (Operation Iraqi Freedom Mental Health Advisory Team Report, 2003).

The Office of the Surgeon General established the second Operation Iraqi Freedom Mental Health Advisory Team in July 2004, here and after called Team II. It was formed to accomplish three tasks: to follow up on the first Operation Iraqi Freedom Mental Health Advisory Team, to assess mental health issues of service members, and to provide recommendations. Team II focused on three broad areas (behavioral health needs assessment, behavioral health delivery system, and unit training requirements) and the Suicide Prevention Program (Operation Iraqi Freedom-II Mental Health Advisory Team Report, 2005).

Team II conducted a service member health and well being survey of, and focus groups with, 2,064 service members in Kuwait and Iraq between August and October 2004. Team II used the same procedure used by Team I to administer the survey. The survey was administered during the same months and to service members who were in Iraq for the same length of time.

The Team II survey population had a larger proportion of National Guard and Reserve service members deployed than did the Team I survey population. Although the Team II survey participants experienced numerous combat stressors, improvements were noted (Operation Iraqi Freedom-II Mental Health Advisory Team Report, 2005).

Team II found that the behavioral healthcare system improved since the Team I evaluation. Coordination was occurring among behavioral health personnel, chaplains, and primary care providers. An improvement in training was noted in combat stress control units, medical companies, combat support hospitals, and at the unit and individual levels. The percentage of mental health problems decreased in the Team II population compared to the Team I population. Team II reported that 5% of the service members screened positive for depression, 5.3% for anxiety, 10.3% for acute stress, and 12.5% for any mental health condition. The survey data collected by Team I showed 6.9% of the service members screened positive for depression, 7.3% for anxiety, 14.6% for acute stress, and 17.7% for any mental health condition. Additionally, 23% fewer service members were evacuated for behavioral health problems in the Team II population than in the Team I population. The numbers of behavioral health personnel in theater and the ratio of behavioral health personnel to service members were higher during the Team II evaluation than during the Team I evaluation (Operation Iraqi Freedom-II Mental Health Advisory Team Report, 2005).

An improvement was noted in the delivery of behavioral health care; however, the perceived stigma and barriers to care were not significantly different. Forty percent of the Team II survey participants with mental health problems self-reported receiving care compared to 29% of the Team I survey participants. Forty-one percent of the Team II survey participants reported having received adequate training in handling the stressors of deployment compared to 29% of



Team I survey participants. The January-December 2004 suicide rate reported by Team II was 8.5 per 100,000 service members, which is lower than the recent Army historical rates (Operation Iraqi Freedom-II Mental Health Advisory Team Report, 2005).

Although improvements had been made, Team II recommended the continual improvement of mental health services in the areas of improving awareness, access to care, and efforts to reduce stigma. It suggested the integration of mental health care with primary care in troop medical clinics and battalion aid stations, a further recommendation was to emphasize the role of leaders at all levels in facilitating the recognition of mental health concerns, training in handling the stressors of deployment, and encouraging the use of available resources (Operation Iraqi Freedom-II Mental Health Advisory Team Report, 2005).

Research conducted by the U.S. Army Medical Research Unit-Europe shows that service members report an increase in psychological symptoms at 120-days post-reintegration compared to the level of symptoms reported immediately upon reintegration. In a blinded study, a matched sample of 509 service members, who previously deployed to Iraq, was surveyed and evaluated for mental health problems. The reports of depression increased from 6.9% to 14.3%, reports of PTSD increased from 1.2% to 4.3%, anger problems increased from 3.3% to 10.6%, and relationship problems increased from 4.7% to 5.5% (Bliese, Wright, Adler, & Thomas, 2004). The PDHRA program developed from this research.

### *Purpose*

The purpose of this study was to identify the risk of depression, PTSD, anger problems, suicidal ideation, social and family conflicts, and alcohol use of service members assigned to units of the 1<sup>st</sup> Cavalry Division and III Corps that supported Operation Iraqi Freedom. Using the PDHRA survey tool, it compared the mental health status of three groups of Fort Hood service



members: those who have deployed once, those who have deployed more than once, and those who have never deployed. Comparing the mental health of these populations may help to ascertain the impact deployments and multiple deployments have on service members. Establishing a baseline may help determine the level to which the population can be restored during the “Resetting the Force” period. The determination of the impact of deployment on mental health of service members is important in order to implement appropriate policy, improve treatment, and establish resources needed.

Null Hypothesis ( $H_0$ ):  $\mu_1 = \mu_2 = \mu_3$

Alternate Hypothesis ( $H_1$ ): not  $H_0$

Where  $\mu_1$  = deployed once,  $\mu_2$  = deployed more than once,  $\mu_3$  = never deployed.

The supporting study objectives were to ensure service members required to complete the PDHRA were identified, providers received training on the PDHRA process, providers received the post-deployment health tool box and accompanying clinical practice guidelines, service members received a PDHRA briefing, computer assets were available and functional, mental health providers were on site, the site set-up allowed for privacy, and administrative personnel were available to make referral appointments.

### Method and Procedures

This descriptive study utilized a quantitative approach to record the mental health characteristics of service members assigned to units of the 1<sup>st</sup> Calvary Division and III Corps who deployed in support of Operation Iraqi Freedom. It compared deployment groups for concerns of depression, PTSD, anger, suicidal ideation, social and family conflict, and alcohol abuse identified by the provider. The dependent variables were operationally defined as the selection of each concern on the PDHRA survey by the provider after interviewing and assessing

the service member. The PDHRA survey is a standardized instrument developed in coordination with all military services and the Department of Veteran Affairs to provide a second health assessment for service members who have returned from deployment in the past 90 to 180 days.

### *Participants*

The target population for this study was active duty Army service members who completed the PDHRA process at Fort Hood between 18 August 2005 and 15 December 2005. During this time, a total of 2,338 personnel completed the PDHRA. Of this number, 107 cases were excluded (5 other than Army; 71 National Guard, Reservists, or other; 5 duplicate cases; 7 deployed to Afghanistan, 19 deployed to “Other”) leaving a total of 2,231 cases ( $n=1,709$  male,  $n=522$  female) included in the study. Of the total, 258 service members were warrant officers or officers and 1,973 were enlisted.

These cases were further divided into three groups: service members who deployed once ( $n=1,498$ ); service members who have deployed more than once ( $n=566$ ), and service members who have never deployed ( $n=167$ ). Table 1 shows the demographic characteristics.

Table 1

*Demographic Characteristics*

Characteristic		Deployment Group (N =2231)					
		Never (n=167)		Once (n=1498)		More Than Once (n=566)	
		<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent
Gender	Male	120	71.9	1150	76.8	439	77.6
	Female	47	28.1	348	23.2	127	22.4
Rank	Warrant Officer and Officer	18	10.8	161	10.7	79	14.0
	Enlisted	149	89.2	1337	89.3	487	86.0

Demographic information for age and marital status was excluded in the data file provided for analysis. Other demographic information was not collected during the PDHRA. The completion of the demographic section of the PDHRA instrument was required; however completion of the remainder of the survey was voluntary (Office of the Surgeon General/ Medical Command Policy Memo 06-005).

*Apparatus*

The screening instrument used during the PDHRA, DD Form 2900, was developed and tested by the Walter Reed Army Institute of Research (Bliese, Wright, Adler, & Thomas, 2004; Bliese, Wright, Adler, Hoge, & Thomas, 2005) and is found at Appendix A. It was selected as the screening tool for the Department of Defense (Assistant Secretary of Defense for Health Affairs Memorandum, 2005, HA Policy 05-011) to identify physical and mental health concerns. The form is not intended for use as a comprehensive screening tool for all health problems.

The DD Form 2900 is divided into four sections: (a) demographic data, (b) health history and concerns, (c) health assessment and referral, (d) and ancillary staff and administration. The demographic and health history sections are completed by the service member, and the



remaining sections are completed by the PDHRA staff. The form includes questions on four (relationship problem, PTSD, alcohol problem, and depression) of the six dimensions (relationship problem, PTSD, alcohol problem, depression, anger problem, and sleep problem) targeted for mental health screening in the literature (Bliese et al., 2004; Bliese et al., 2005).

The demographic section is used to collect information on gender, date of birth, marital status, service branch, location of Operations, total deployments in the past 5 years, status prior to deployment, pay grade, contact information, unit assigned, and location assigned. The questions regarding the number of deployments and location of operation were used to determine the independent variables.

The health history section consists of 16 questions divided among the following four categories: general health, exposure concerns, mental health, and requests for assistance. Questions 1 through 6 cover general and overall health status. These questions give service members an opportunity to describe their general health and to voice any concerns they may have.

Question 7: “Do you have any persistent major concerns regarding the health effects of something you believe you may have been exposed to or encountered while deployed?” is aimed at identifying exposure concerns. It is rated as either “yes” or “no”. The question contains a list of common chemicals and environmental hazards to choose from, with the ability to fill in additional items that are not listed. It is common for redeploying service members to have concerns about health effects related to biological, chemical, and physical substance or agent exposures that they believe they experienced during deployment (Post-Deployment Health Evaluation and Management Clinical Practice Guideline, 2001).

The Mental Health Screening Questions, numbers 8 through 12, are targeted at identifying mental health concerns, adjustment problems, and behavioral risks. The dimensions of mental health included are relationship problems (question 8), PTSD (question 9), alcohol problems (question 10), and depression (question 11) (Deployment Health Clinical Center, 2005).

The DD Form 2900 was validated by the Walter Reed Army Institute of Research (Bliese et al., 2005) utilizing data collected from three, blind-validation studies. The studies used a paper and pencil screening instrument that included the dimensions of mental health: relationship problems, alcohol problems, anger problems, sleep problems, PTSD, and depression. The service member responses to the questionnaire were evaluated. Service members who exceeded established criteria on any of the clinical dimensions of mental health received a follow-up interview with a clinical provider. A comparison group that included 20%-30% of the service members who scored below the established criteria was selected to receive the same clinical interview. The clinical providers conducting the interviews did not have the results of the screening instrument, therefore, they did not know whether a service member scored positive or was a control (Bliese et al., 2005).

The first study was conducted with 739 service members screened prior to deployment to Iraq in 2004. Of these, 356 service members were interviewed by a mental health provider- 164 who screened positive for a potential mental health problem and 192 randomly-selected service members who screened negative. The second study was conducted with 1,578 service members who were screened after returning from combat in Iraq in 2004. Of these, 592 were selected to receive a structured interview with a mental health provider- 218 who screened positive and 374 who screened negative. The third study was conducted in 2005 with 724 service members

screened 3 months following combat in Iraq. Of these, 367 were interviewed by a mental health provider- 259 who screened positive and 109 who screened negative (Bliese et al., 2005).

Criteria for scoring the DD Form 2900 were based on these studies and identified below.

Question 8: “Since return from your deployment have you had serious conflicts with your spouse, family members, close friends, or at work that continue to cause you worry or concern?” inquires about relationship problems. It is rated on a 3-point scale with a choice of “yes,” “no,” or “unsure.” Relationship problems addressed using question 8 correctly identified those who had problems (sensitivity) 58% of the time and correctly identified those who did not have problems (specificity) 81% of the time, when the response is coded positive for the selection of “yes” or “unsure” by the service member (Bliese et al., 2005).

Question 9: “Have you had any experience that was so frightening, horrible, or upsetting that IN THE PAST MONTH, you...” is a 4-part question that screens for post-traumatic stress disorder. It inquires about the most common symptoms of PTSD: nightmares, avoidance, hyper-alertness, and detachment. It is rated as either “yes” or “no” to each part of the question. A positive response to any of the four questions on this scale leads to additional questioning. The current PTSD Clinical Practice Guideline recommends further evaluation for PTSD with the selection of two or three symptoms by the service member. Bleise et al. (2005) recommends a positive score for the report of two symptoms. Using this criterion, in one study, the question correctly identified those who had PTSD symptoms (sensitivity) approximately 73% of the time, and correctly identified those who did not have PTSD symptoms (specificity) more than 88% of the time. Another study found a sensitivity of 79% and a specificity of 78% using the same criterion. Additional questioning should explore the severity, duration, and functional impairment associated with reported symptoms (Management of Post-Traumatic Stress, 2004).



Question 10 screens for alcohol problems and was adopted from Brown, Leonard, Saunders, and Papasouliotis (2001). It includes two questions: "In the PAST MONTH, did you use alcohol more than you meant to?" and "In the PAST MONTH, have you felt that you wanted to or needed to cut down on your drinking?" Both questions are rated as either "yes" or "no." The post-deployment guideline recommends additional questions about the amount of alcohol consumed, the number of days per week alcohol was consumed, and any negative consequences such as hangovers, inability to get to work in the morning, impulsive behavior while drinking, drinking and driving, or problems with family and friends because of drinking for a positive response to either question (Management of Substance Use Disorder in the Primary Care Setting, 2004). Bliese et al. (2005) found when the questionnaire response was coded as positive for the selection of "yes" to both questions, the sensitivity was 33% and specificity was 94% in the pre-deployment sample. The sensitivity was 73% and the specificity was 86% in the post-deployment sample. Bliese et al. (2005) recommends further evaluation with a positive response to both questions.

Question 11 is a 2-part question to screen for depression. It consists of a stem question ("Over the PAST MONTH, have you been bothered by the following problems?") and two screening questions ("Little interest or pleasure in doing things" and "feeling down, depressed, or hopeless"). The two questions in this scale have been shown to be as effective as longer scales for identifying patients who may be depressed (Management of Major Depressive Disorder in Adults in the Primary Care Setting, 2004). The questions are rated on a 4-point scale: "not at all," "few or several days," "more than half the days," and "nearly every day." Bliese et al., (2005) recommends scoring the response as positive if "more than half the days" or "nearly every day" was marked on either of the screening questions. Using this scoring criterion the question

correctly identified those who had symptoms (sensitivity) approximately 73% of the time and correctly identified those who did not have symptoms (specificity) more than 85% of the time (Bliese et al., 2005).

Question 12 asks about functional impairment: “If you checked off any problems or concerns on this questionnaire, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?” The answer choices are “Not difficult at all,” “Somewhat difficult,” “Very difficult,” or “Extremely difficult.” Problems and concerns may be common during the first 6 months post-deployment; however, symptoms that create impairment in the individual’s ability to function may require further evaluation and treatment. A selection of “Very difficult” or “Extremely difficult” on the questionnaire indicates the need for further evaluation by a health care provider (Post-Deployment Health Evaluation and Management Clinical Practice Guideline, 2001).

Questions 13 through 16 are designed to provide an opportunity for the service member to initiate a self-referral for healthcare, information, or counseling. These questions are also designed to help match the treatment modality to the preferences of the patient, which has been found to increase the probability of follow-through with the referral as well as efficacy of the care received (Post-Deployment Health Evaluation and Management Clinical Practice Guideline, 2001).

The health assessment and referral section of the form consists of the “Provider Review and Interview” and the “Assessment and Referral.” The role of the screening provider in the PDHRA Program is to interview the service member, evaluate his or her health conditions and concerns, and refer the individual for additional evaluation or for healthcare or to community support services when indicated. This section of the form is designed to guide the provider



through the screening and assessment process and to aid in recording the encounter for the medical record (Deployment Health Clinical Center, 2005).

The provider reviews and discusses each individual's responses to Questions 1-16 with him or her. All positive answers are pursued and additional information is obtained. The provider is required to ask every service member the screening questions in Item 2: "Over the PAST MONTH, have you been bothered by thoughts that you would be better off dead or of hurting yourself in some way?" and "Since return from your deployment, have you had thoughts or concerns that you might hurt or lose control with someone?" These questions direct the provider to conduct an assessment of the potential of the service member for harming self or others. Symptoms of depression or PTSD identified during the review and interview increase the likelihood of suicidal ideation or aggressive behavior. Anger and irritability, in particular, are common manifestations of depression in young men and should be reported if observed (Deployment Health Clinical Center, 2005).

Item 4 provides an opportunity to record any additional questions or concerns identified by the service member during the interview. The provider documents his or her assessment in Item 5, and indicates the categories of symptoms identified along with an indication of the severity of the symptoms and whether or not the individual is currently receiving care for the identified concern. The provider documentation in item 5 was used to determine the dependent variables. The severity of a symptom was rated as "0" for absent, "1" for minor concern, and "2" for major concern (Deployment Health Clinical Center, 2005).

The recommendation for referrals is recorded in Item 6. Individuals who request mental health or community service support may be referred directly to the requested professional. Otherwise, referral to a primary care provider for further evaluation or treatment under the Post-



Deployment Health Evaluation and Management Clinical Practice Guideline is the preferred course of action (Deployment Health Clinical Center, 2005).

The Ancillary Staff section consists of two administrative questions (Items 9 and 10) to be completed by support staff assisting in the screening process. While it is mandatory for the assessment to be offered to every redeployed service member, the extent of their disclosure and participation is voluntary, except in obvious cases of threat of harm to self or others. This section provides an opportunity to record those decisions to decline services (Deployment Health Clinical Center, 2005).

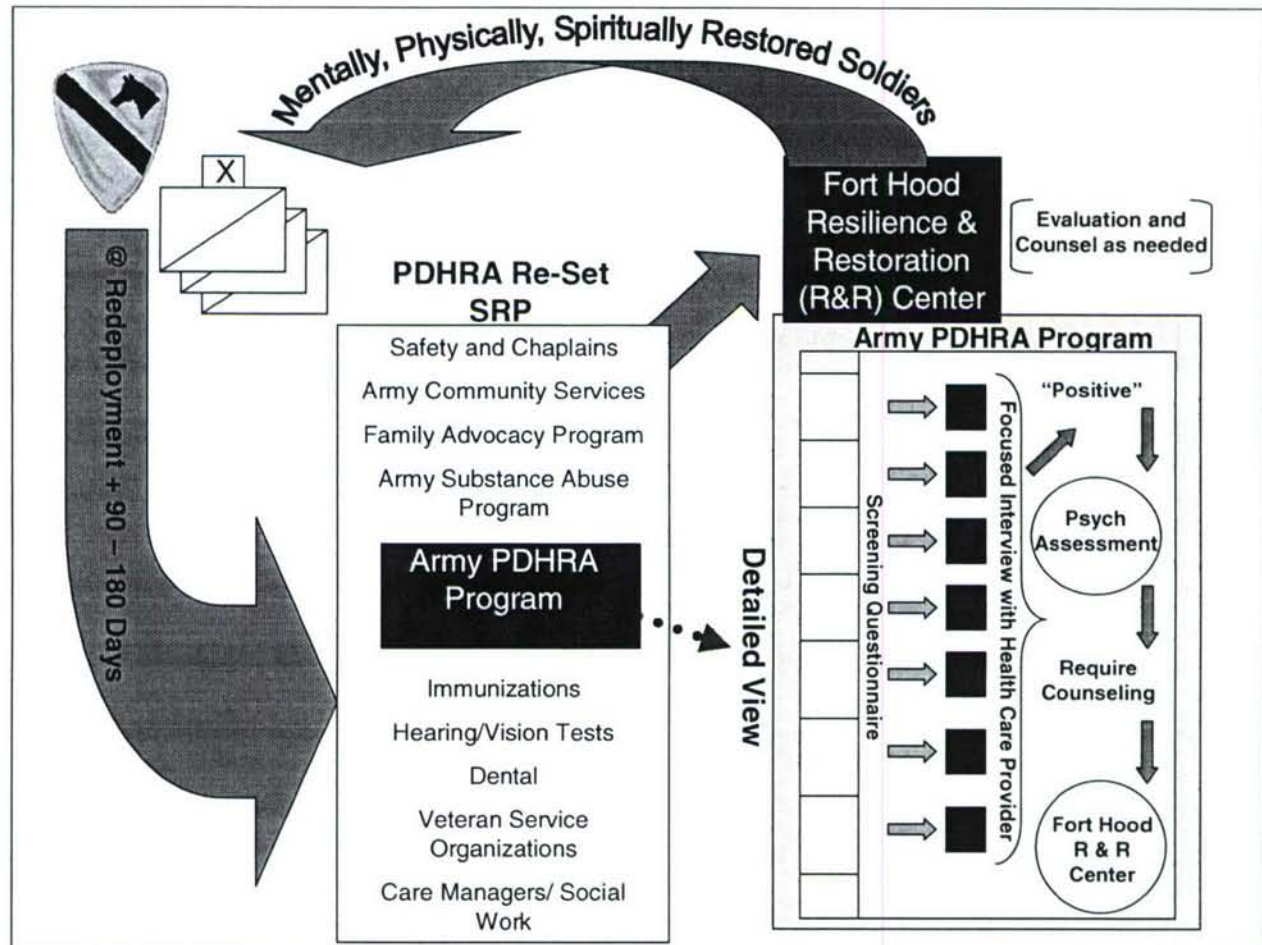
### *Procedure*

Service members completed the PDHRA process 90-180 days after returning from deployment. The PDHRA was designed as a Re-Set Soldier Readiness Processing (RSRP) program<sup>3</sup>. Participation from several entities was encouraged. The Fort Hood Safety Office, Army Community Services, Family Advocacy Program, Alcohol and Substance Abuse Program, chaplains, and veterans' service organizations were invited to participate and set-up tables, booths, and displays. Additionally, immunizations, dental exams, and hearing and vision screenings were available. Social Work Services and Case Management was on site to assist service members. A diagram of the concept of operation is found at Figure 1.

---

<sup>3</sup> Re-Set Soldier Readiness Processing (RSRP) prepares redeploying service members for future missions. The program is designed to ensure medical and dental deployment readiness.

Figure 1

*Fort Hood Post-deployment Health Reassessment Concept of Operation*

*Note.* At Fort Hood the Post-deployment Health Reassessment (PDHRA) is part of the re-setting the soldier readiness process (Re-Set SRP). "Reset" is part of Army Force Generation. This concept applied at Fort Hood is to have mentally, physically, and spiritually restored service members after completing the process and follow-up for health care. At 90-180 days after returning from deployment, service members complete the PDHRA and other medical requirements. A variety of resources is available for assisting service member needs. Those service members who screen positive for a mental health concern after completing the focused interview with a health care provider may receive a more detailed evaluation by a provider trained in mental health. The service member is referred to Fort Hood Resilience and Restoration Center (R&R) if needed.

There were five components to the screening process: (a) The providers and service members received a separate briefing; (b) the service members completed the demographic data and health history and concerns sections of the PDHRA screening instrument using a computer kiosk that recorded responses in MedBase;<sup>4</sup> (c) the health assessment and referral section was completed by a credentialed health care provider (physician, physician assistant, or nurse practitioner), and recorded in MedBase; (d) the administrative staff completed referrals and scheduled follow-up appointments as needed. The administrative staff also documented the education and information given to the service member and if the service member declined to complete the PDHRA process; and (e) the DD Form 2900 was then sent electronically to the Army Medical Surveillance Activity at Walter Reed Army Medical Center for inclusion in the Defense Medical Surveillance System.

Prior to screening, providers received refresher training on the Deployment Health Programs, Department of Defense and Veterans Health Affairs Clinical Practice Guidelines, the PDHRA process, and policies and procedures for documentation by medical and behavioral health providers. Additionally, the training resources used throughout the Department of Defense were reviewed. The resources explained the importance of the PDHRA as service members return from combat and other deployment health-related initiatives. The briefing explained the DD Form 2900 in detail and explained the provider role in the PDHRA process. Health care providers were given a post-deployment health tool box that contained algorithms for the Post-Deployment Health Evaluation and Management Clinical Practice Guideline and additional screening instruments (Office of the Surgeon General/ Medical Command Policy Memo 06-005).

Service members also received a briefing on the PDHRA process, the right of refusal, and an overview of the common stress responses to deployment. The briefing was conducted in

---

<sup>4</sup> MedBase is a Great Plains Army Medical Command regional database for storing health information.

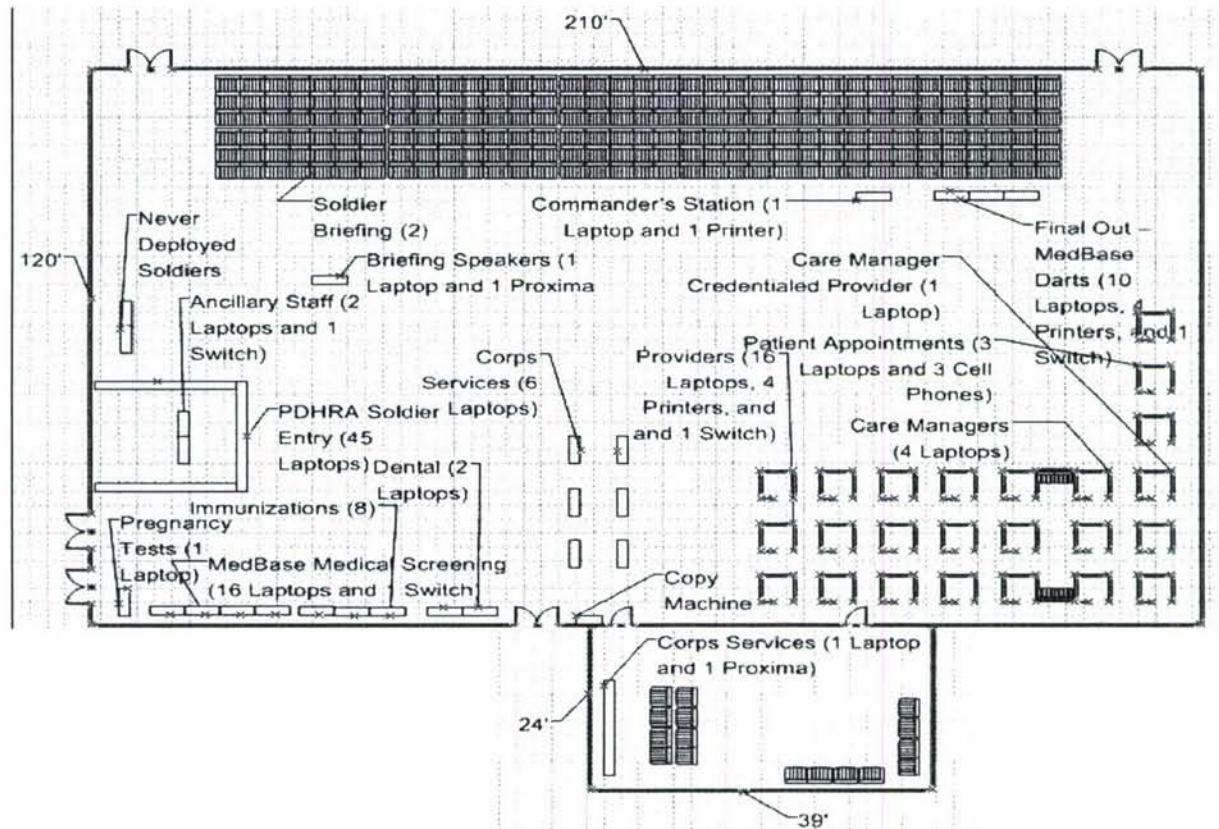


groups that were comprised mainly of service members who were members of the same unit. Service members who redeployed as individuals, for example medical personnel, were included in a group completing the PDHRA during the same time. The briefing focused on the transition from combat to home, with an emphasis on normal and abnormal behavioral health responses, and how to receive assistance for mental health concerns. It was conducted by behavioral health personnel or senior non-commissioned officers with behavioral health and deployment experience. An opportunity for discussion followed the briefing. At the conclusion, service members were notified that completion of the demographic section of the PDHRA was mandatory, while completion of the remainder of the survey was voluntary (Office of the Surgeon General/ Medical Command Policy Memo 06-005).

Once the briefing was completed, service members were asked to electronically answer the demographics and health screening questions of the PDHRA instrument. For service members who did not deploy, the phrase “during the past year” was used in place of the word “deployment” on the electronic DD Form 2900. The average time required to complete the survey was 10 minutes. To ensure confidentiality, privacy screens were placed on all computers. Once the questions to be answered electronically were completed, the service member had a focused interview with a credentialed health care provider. The space used for the interview by the provider was partitioned and separated for privacy. Figure 2 shows the site layout.

Figure 2

*Fort Hood Post-deployment Health Reassessment (PDHRA) setup at Abrams Gymnasium*



The purposes of the interview were (a) to discuss any health concerns the service member may have and (b) to evaluate the general health, mental health, and readjustment issues associated with his or her most recent deployment. If the medical records were available, responses on the Pre- and Post-Deployment Health Assessment forms were compared with the DD Form 2900. If not available, service members were questioned about their health status before and after the most recent deployment, or within the past year if never deployed. The document provided to the primary care provider for the interview process is at Appendix B.

The health care provider reviewed the answers from the health history and concern sections of the PDHRA and made modifications or clarifications to answers based on the interview with the service member. If signs and symptoms were chronic, persistent, or



unremitting over time, or if they interfered with normal functioning in the individual's personal or work life, their families, or their communities, medical intervention was recommended. The health care provider also asked behavioral risk questions during this interview.

The healthcare provider determined if a more detailed diagnostic evaluation, additional treatment, or health-related information was needed. Based on the provider assessment, appropriate referrals for further evaluation and treatment were made. General health concerns and conditions that needed additional assessment beyond the time and circumstances provided were referred to the service member's primary care provider for further evaluation or treatment under the Post-Deployment Health Evaluation and Management Clinical Practice Guideline. Any service member who screened positive for mental health concerns received further evaluation from an on-site provider trained in mental health, or was referred for further evaluation and treatment (Figure 3).

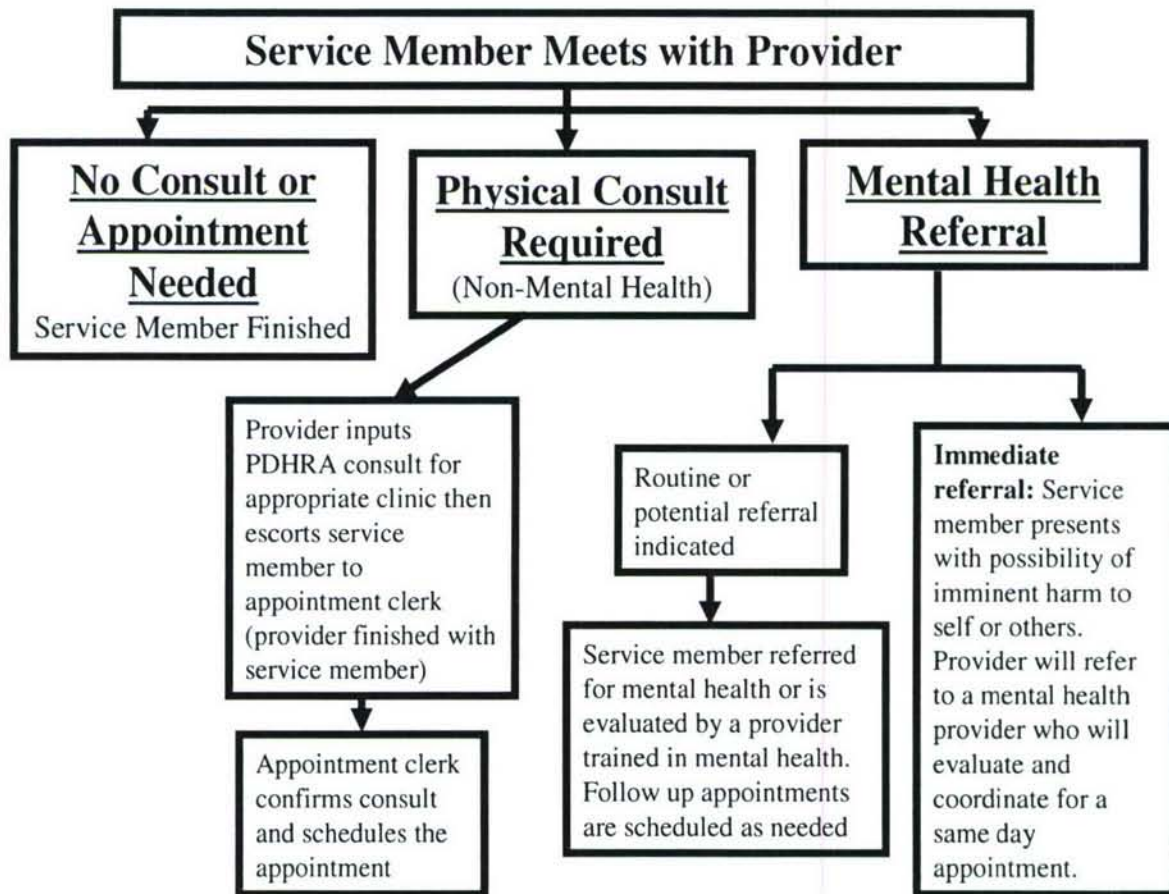
If a routine mental health referral was indicated, the provider generated a Composite Health Care System (CHCS) consultation and escorted the service member to the appointment clerk. If the provider identified a potential need for a mental health referral or was concerned about imminent harm to self or others, the service member was escorted to a trained behavioral health provider (care manager). If a need for treatment was confirmed, a CHCS consultation for mental health services was generated and the appointment was scheduled. If the service member was at immediate risk to harm self or others a same day appointment was generated and the soldier was escorted to the Fort Hood Resilience and Restoration Center. Mental health appointments for the PDHRA were provided by a combination of behavioral health providers from Darnall Army Community Hospital, III Corps, and Veterans Affairs at the Fort Hood



Resilience and Restoration Center. The health care provider documented concerns, conditions, and referrals made in MedBase.

Figure 3

*Fort Hood Post-deployment Health Reassessment Process for Referral*



### *Data Analysis*

Patient confidentiality was ensured by coding each survey with a number (1 to 2,231) which was used for tracking cases and data entry. Identifying information, such as name and social security number, were not contained in the data file. The data analysis was performed using SPSS version 14.0.

Mutually exclusive, categorical exhaustive variables included gender, several health questions completed by the patient (questions 4,5,6,7,9,10,13,14,15,16) and item 2 in the provider section. Gender was coded as “1” for female and “0” for male. The remainder of the nominal level variables was coded “1” for yes and “0” for no. All other variables were coded as interval level data. Survey questions were coded “0” to reflect the absence of a symptom or property with highest number representing the most severe choice. Any questions left blank were coded as missing values and not included in statistical analysis.

The independent variables were the three groups of service members (deployed once, deployed more than once, and never deployed). The independent variables were coded “1”, “2”, and “0”, respectively. “Deployment” is defined as “any current or past event or activity that relates to duty in the armed forces that involves an operation, location, command or duty that is different from the military member’s normal duty assignment” (Post-deployment Health Evaluation and Management Clinical Practice Guideline, 2001, p.7). For this study, deployment was defined as a total of 1 or more deployments selected by the service member on the DD Form 2900. It was calculated by combining all values selected in the “Total Deployments in past 5 Years” field. The electronic form had an option for the service member to select “non-deployed.”

The dependent variables were the degree of concern identified by the provider for: relationship problems, PTSD, alcohol problems, depression, anger problems, and suicidal ideation; and were operationally defined as the selection of the category on the DD Form 2900<sup>5</sup> by the provider after the interview was conducted. The degree of concern was operationally defined as the selection of minor, major, or absence of a selection on the DD Form 2900 by the provider after the interview was conducted. The dependent variable was coded “0” for the

---

<sup>5</sup> The dependent variables were named for consistency and are written as depression symptoms, PTSD symptoms, and Social/ Family Conflict on the DD Form 2900.

absence of a selection, “1” for a minor concern, and “2” for a major concern for each category listed in item 5 of the DD Form 2900.

Descriptive statistics were computed on demographic variables and reported in tables as numbered totals and frequency percentages. Means and standard deviations were computed for the items making up the dependent and independent variables. Frequencies of ratings for survey questions 8, 9, 10, 11 and provider evaluation items were also computed.

Reliability of the soldier screening was tested by computing the Cronbach’s coefficient alpha for PTSD (question 9). This method tested reliability of the items in a scale to measure the same attribute. Results above 0.7 were considered significantly consistent. Each dimension of mental health was then correlated to the corresponding dependent variable (relationship problems, PTSD, alcohol problems, depression,) found in item 5 of the health care provider section of the survey. This method was used to test criterion-related validity.

An analysis of variance (ANOVA) was computed to compare the means of the three groups (deployed once, deployed more than once, and never deployed) and the degree of concern the provider identified during the PDHRA for each dependent variable (relationship problems, PTSD, alcohol problems, depression, anger, and suicidal ideation,). Statistical significance was determined using the *F* ratio. Differences were considered statistically significant if the *F* ratio was 2.99, meaning in fewer than five samples out of 100 would that association be due to chance alone. To determine the exact nature of the association, which pairs are significantly different from one another, a multiple comparison procedure Tukey’s honestly significant difference test was performed.



## Results

### *Demographics*

Table 2 summarizes the characteristics of the survey population. A total of 522 service members were female (23%) and 1,709 were male (77%). The majority of the participants were enlisted (88%). The largest deployment group consisted of service members who deployed once comprising, 67% of the participants.

Gender is evenly dispersed throughout the three deployment groups, 72% to 78% male, and 23% to 28% female. The most frequent reported rank was E1 through E4 (36% to 70%). The never deployed group had the largest percentage of respondents in the E1 through E4 category (70%), followed by the deployed once group (45%) and the deployed more than one group (36%). The never deployed group tended to have a higher percentage of enlisted in the ranks of E1 through E4 and officers in the ranks of O1 through O3 than the other groups. Service members in the rank of E5 through E6 were most likely to deploy more than once.

Twenty-two percent of service members who never deployed indicated an excellent personal health status compared to 13% of the deployed once group and 11% of the deployed more than once group. The majority of respondents in each group rated personal health status as very good or good. Personal health status ratings of fair were evenly distributed among the groups. Three to four percent of the groups that deployed rated personal health status as poor. The highest frequencies for health care visits were 2-3 visits for all groups. The never deployed group had the highest percentage of service members with 4-5 healthcare visits (19%), while the other groups had the highest percentage of visits in the Over 5 category, (19%). The never deployed group had the highest percentage of respondents who were physically injured (25%).

Table 2

*Frequency and Percent of Deployment Group Characteristics*

Characteristic		Deployment Group					
		Never (n=167)		Once (n=1498)		More Than Once (n=566)	
		n	Percent	n	Percent	n	Percent
Gender	Male	120	71.9	1150	76.8	439	77.6
	Female	47	28.1	348	23.2	127	22.4
Rank	E1-E4	117	70.0	667	44.5	205	36.2
	E5-E6	25	15.2	524	35.1	222	39.2
	E7-E9	7	4.2	146	9.7	60	10.6
	WO	1	.5	24	1.6	20	3.6
	O1-O3	16	9.6	89	5.9	38	6.7
	O4-O6	1	.5	48	3.2	21	3.7
Personal Health Status <sup>a</sup>	Excellent	36	21.6	196	13.1	64	11.3
	Very Good	59	35.3	410	27.4	156	27.6
	Good	52	31.1	566	37.8	242	42.8
	Fair	20	12.0	252	16.8	85	15.0
	Poor	0	0.0	60	4.0	17	3.0
Health care Visits <sup>a</sup>	None	41	24.6	343	23.0	134	23.7
	1	31	18.5	277	18.6	95	16.8
	2-3	41	24.6	401	26.8	166	29.3
	4-5	31	18.5	187	12.5	64	11.5
	Over 5	23	13.8	285	19.1	105	18.7
Physically Injured <sup>b</sup>	Yes	41	24.6	307	20.5	116	20.5
	No	126	75.4	1186	79.1	447	79.0

Note. <sup>a</sup> Seven cases had missing values: 4 from the deployed once group and 2 from the deployed more than once group.

<sup>b</sup> Eight cases had missing values: 5 from the deployed once group, and 3 from the deployed more than once group.

### *Descriptive Statistics*

#### *Soldier Survey*

The soldiers' survey contained four multi-part screening questions that fell into the four dimension of mental health: relationship problem, PTSD, alcohol problem, and depression. These were survey questions 8 through 11 and were completed by the service member. The computed variable for each dimension was also summarized. The responses for each deployment group are reported in Table 3.

The percentage of relationship problems reported seems to be correlated to deployment. Ten percent of the never deployed group screened positive for relationship problems, compared to 23% of the deployed once group and 26% of the deployed more than once group. In the deployed more than once group, two cases were missing data on this dimension.

The groups that deployed had a higher percentage of service members who screened positive for PTSD than the never deployed group. Both deployment groups had 18% who screened positive for PTSD while the never deployed group had 8% who screened positive for PTSD. The never deployed group members who selected "yes" to part of the PTSD screening question most frequently responded to avoiding situations and feeling numb (8% and 7% respectively). In the deployed once group, data were missing for six cases for the startle/on guard screen and for five cases for the remainder of the four screening questions. This group most frequently responded "yes" to being on guard, watchful, or easily startled (19%) and feeling numb or detached from others, activities, or surroundings (17%). In the deployed more than once group, data were missing for two cases for the felt numb screen and three cases for the remainder of the screening questions. This group also responded most frequently to the startle/on guard



screen (21%) and feeling numb (17%). The percentage of responses for being on guard, watchful, or easily startled was the highest in the deployed more than once group.

Four percent of the never deployed group, 5% of the deployed once group, and 6% of the deployed more than once group, screened positive for alcohol problems. Eleven percent of the deployed more than once group responded “yes” to the question, “In the PAST MONTH, did you use alcohol more than you meant to?” Eight percent of the deployed once group responded “yes” to the same question followed by four percent of the never deployed group. Two members of the deployed more than once group and seven members of the deployed once group did not answer the question. The responses were similar for the question “In the PAST MONTH, have you felt that you wanted to or needed to cut down on your drinking?” Six members of the deployed once and deployed more than once groups did not respond to the question.

Fifteen percent of the deployed once and deployed more than once groups screened positive for depression, while 11% of the never deployed group had a positive screen. The stem question (“Over the PAST MONTH, have you been bothered by the following problems?”) had two parts. A larger percentage of the groups that deployed responded “More than half the days” and “Nearly every day” than the group that did not deploy to the first part (“Little interest or pleasure in doing things”). In the deployed once group data were missing for five cases for the first part of the question and six cases for the second. In the deployed more than once group data were missing for three cases for both parts of the question.

The two groups that deployed had a higher percentage of positive screens for all dimensions of mental health than the never deployed group. The relationship problem and PTSD dimensions had the highest percentage of positive screens for the groups that deployed.

Table 3

*Soldiers' Survey across Deployment Groups*

		Deployment Group					
		Never ( <i>n</i> =167)		Once ( <i>n</i> =1498) <sup>a</sup>		More Than Once ( <i>n</i> =566) <sup>a</sup>	
Mental Health Dimension <sup>b</sup>	Survey Response	<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent
Relationship Problem	Yes	17	10.2	344	23.0	149	26.4
	No	150	89.8	1149	77.0	415	73.6
PTSD	Yes	14	8.4	272	18.2	101	18.0
	No	153	91.6	1220	81.8	460	82.0
Nightmares	Yes	10	6.0	200	13.4	72	12.8
	No	157	94.0	1293	86.6	491	87.2
Avoid Situations	Yes	13	7.8	188	12.6	74	13.1
	No	154	92.2	1305	87.4	489	86.9
Startle/ On Guard	Yes	7	4.2	287	19.2	120	21.3
	No	160	95.8	1205	80.8	443	78.7
Felt Numb	Yes	11	6.6	257	17.2	94	16.7
	No	156	93.4	1236	82.8	470	83.3
Alcohol Problem	Yes	4	2.4	69	4.6	32	5.7
	No	163	97.6	1421	95.4	528	94.3
Drink more than intended	Yes	7	4.2	115	7.7	0	10.6
	No	160	95.8	1376	92.3	504	89.4
Felt need to cut down	Yes	9	5.4	121	8.1	57	10.2
	No	159	95.2	1371	91.9	503	89.8
Depression	Yes	18	10.8	217	14.6	83	14.7
	No	149	89.2	1271	85.4	480	85.3
Little Interest	Not at all	117	70.1	854	57.2	327	58.0
	Few or several days	38	22.8	453	30.3	167	29.7
	More than half the days	7	4.2	110	7.4	42	7.5
	Nearly every day	5	2.9	76	5.1	27	4.8
Feeling down	Not at all	122	73.1	942	63.1	376	66.8
	Few or several days	30	17.9	409	27.4	139	24.7
	More than half the days	11	6.6	89	6.0	36	6.4
	Nearly every day	4	2.4	52	3.5	12	2.1

Note.<sup>a</sup> Cases with missing values were excluded. <sup>b</sup> Survey items in this table are an abbreviated form of the questions contained on the DD Form

*Provider Assessment*

Primary care providers documented assessments based on an interview and the review of the service member's response. The mental health concerns identified by the provider correspond to the dimensions of mental health (relationship problem, PTSD, alcohol problem, and depression) of the soldiers' survey. Providers also reported concerns they had for anger problems and suicidal ideation. The findings are summarized in Table 4.

The providers recommended further evaluation and follow-up at a higher rate for the groups that deployed than for the group that did not deploy for all dimensions except depression. Five to six percent of each group was identified as having a minor concern and one to three percent as having a major concern for depression. The deployed more than once group had the highest percentage identified as a major concern for the relationship problem (4%), followed by 3% of the deployed once group and 2% of the never deployed group. The deployed once group had the highest percentage identified as both a minor concern and a major concern for PTSD with 4% and 3%, respectively.

A comparison of the soldier responses to the questionnaire (summarized in Table 3) and the subsequent provider assessment (summarized in Table 4) shows different rates of positive mental health screens. The percentage of each group in which providers identified a concern was less than the percentage identified by the screening questions. Twenty-six percent of the deployed more than once group screened positive for relationship problem on the soldiers' survey; however, 5% were identified as having a minor concern and 4% as having a major concern during the provider assessment. Both deployed groups had 18% screen positive for PTSD while the provider identified approximately 4% as having a minor concern and 3% with a major concern for PTSD.



Table 4

*Provider Assessment across Deployment Groups*

		Deployment Group					
Provider Concern	Degree of Concern	Never (n=167)		Once (n=1498)		More Than Once (n=566)	
		n	Percent	n	Percent	n	Percent
Relationship Problem	None	163	97.6	1374	91.7	517	91.4
	Minor	3	1.8	80	5.4	28	4.9
	Major	1	0.6	44	2.9	21	3.7
PTSD	None	166	99.4	1405	93.8	535	94.5
	Minor	0	0.0	55	3.7	19	3.4
	Major	1	0.6	38	2.5	12	2.1
Alcohol Problem	None	165	98.8	1462	97.6	546	96.5
	Minor	1	0.6	27	1.8	17	3.0
	Major	1	0.6	9	0.6	3	0.5
Depression	None	157	94.0	1371	91.5	519	91.7
	Minor	8	4.8	81	5.4	32	5.6
	Major	2	1.2	46	3.1	15	2.7
Anger Problem	None	162	97.0	1413	94.4	537	94.9
	Minor	3	1.8	53	3.5	20	3.5
	Major	2	1.2	32	2.1	9	1.6
Suicidal Ideation	None	165	98.8	1491	99.5	563	99.5
	Minor	1	0.6	2	0.1	3	0.5
	Major	1	0.6	5	0.4	0	0

Note. Variables adapted from item 5 on the health care provider section of the DD Form 2900

*Reliability*

The reliability coefficient was computed to measure internal consistency for survey question 9. The alpha coefficient was greater than 0.79 indicating that the four items on the scale were measuring the same underlying dimension.

### *Correlations*

Correlation coefficients were computed for the independent variable (deployment group), the demographic variables, and the soldier's survey variables (questions 8-11). The findings are summarized in Table 5.

Deployment group was significantly correlated ( $p < .01$ , two tailed) with rank, personal health status, relationship problem, one PTSD symptom (startle/ on guard), and both parts of the alcohol screening (question 10). Deployment group was not correlated with the remaining variables.

The demographic variables were gender, rank, personal health status, the number of health care visits, and physically injured. Gender was significantly correlated ( $p < .01$ , two tailed) with rank, personal health status, number of health care visits, and drinking more than intended. Gender was correlated ( $p < .05$ , two tailed) with being constantly on guard, watchful, or easily startled; feeling the need to cut down on drinking alcohol; and feeling down, depressed or hopeless. Gender was not correlated with being physically injured, relationship problems, the remaining PTSD symptoms (nightmares, avoiding situations, feeling numb), or experiencing little interest or pleasure in doing things. Rank and personal health status were significantly correlated ( $p < .01$ , two tailed) with all variables. The number of health care visits was not correlated with deployment group. However, the number of health care visits was correlated ( $p < .05$ , two tailed) with using alcohol more than intended, and with all other variables ( $p < .01$ , two tailed). Being wounded, injured, assaulted or otherwise physically hurt was not correlated with deployment group or gender. It was correlated with feeling the need to cut down on alcohol, ( $p < .05$ , two tailed) and with all remaining variables ( $p < .01$ , two tailed).

Question 8 on the soldiers' survey screened for relationship problems. A relationship problem was not significantly correlated with gender. It was correlated ( $p < .01$ , two tailed) with all other variables.

The PTSD question screened for four symptoms (nightmares; avoiding situations; being constantly on guard, watchful, or easily startled; and feeling numb or detached). Three of the symptoms (nightmares, avoiding situations, and feeling numb or detached) were not correlated with deployment group or gender. Being constantly on guard, watchful, or easily startled was correlated ( $p < .01$ , two tailed) with deployment group and gender ( $p < .05$ , two tailed). The PTSD symptoms were correlated ( $p < .01$ , two tailed) with the remaining variables.

Both parts of the screening question for an alcohol problem were correlated with all variables. Drinking alcohol more than intended was correlated with the number of health care visits ( $p < .05$ , two tailed) and with the remaining variables ( $p < .01$ , two tailed). Feeling the need to cut down on drinking was correlated with gender and being physically injured ( $p < .05$ , two tailed) and with the remaining variables ( $p < .01$ , two tailed).

Neither part of the depression question was correlated with deployment group. Having little interest or pleasure in doing things was not correlated with gender; however, feeling down, depressed, or hopeless was correlated with gender ( $p < .05$ , two tailed). Both parts of the depression question were correlated to all other variables ( $p < .01$ , two tailed).



Table 5

*Correlations for Demographics and Soldiers' Survey across Deployment Groups*

Variable	n	Corresponding Variable Number														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Deployment group	2231	—	.03 <sup>a</sup>	.09	.06	.00 <sup>a</sup>	-.02 <sup>a</sup>	.06	.03 <sup>a</sup>	.03 <sup>a</sup>	.08	.04 <sup>a</sup>	.06	.04	.03 <sup>a</sup>	-.01 <sup>a</sup>
2. Gender	2231		—	.07	-.07	-.19	.03 <sup>a</sup>	.01 <sup>a</sup>	.00 <sup>a</sup>	.01 <sup>a</sup>	.04*	.00 <sup>a</sup>	.07	.05*		-.05*
3. Rank	2231			—	.15	-.06	-.04	-.08	-.10	-.11	-.12	-.09	-.10	-.08	-.14	-.15
4. Personal health Status	2225				—	.48	.18	.22	.24	.28	.30	.33	.16	.13	.41	.38
5. Health care visits	2224					—	.28	.17	.16	.19	.18	.20	.05*	.03	.21	.24
6. Physically injured	2223						—	.08	.16	.16	.18	.11	.09	.04*	.09	.11
7. Relationship problem	2231							—	.26	.32	.31	.40	.15	.14	.38	.39
8. Nightmares	2223								—	.60	.47	.42	.21	.14	.29	.32
9. Avoid situations	2223									—	.48	.47	.19	.16	.34	.40
10. Startle/ on guard	2222										—	.47	.22	.19	.34	.35
11. Felt numb	2224											—	.19	.16	.50	.50
12. Drink more than intended	2222												—	.53	.24	.15
13. Felt need to cut down	2219													—	.23	.20
14. Little interest	2223														—	.73
15. Feeling down	2222															—

Note. <sup>a</sup> not significantly correlated, \*  $p$  value < .05, all other correlations are significant at the .01 level, two-tailed.

Table 6 reports the correlations that were computed for the deployment group, soldiers' survey, and the provider assessment. The correlations were significant ( $p < .01$ , two tailed) for the dimensions of mental health (relationship problem, PTSD, alcohol problem, depression) on both the soldier survey and the provider assessment. Suicidal ideation was most highly correlated with a positive screen for a relationship problem on the soldiers' survey. Suicidal ideation was not correlated with a positive screen for an alcohol problem on the soldiers' survey or with an alcohol problem identified by the provider. Deployment group was significantly correlated ( $p < .01$ , two tailed) with a positive screen for a relationship problem on the soldiers' survey. Correlations were significant ( $p < .05$ , two tailed) for the provider assessment of a relationship problem and deployment group.

Table 6

*Correlations for Soldiers' Survey and Provider Assessment across Deployment Groups*

Variable	<i>n</i>	Corresponding Variable Number										
		1	2	3	4	5	6	7	8	9	10	11
Soldiers' Survey												
1. Relationship Problem	2231	—	.41	.17	.37	.43	.26	.13	.32	.27	.82	.08
2. PTSD	2220		—	.18	.40	.24	.37	.16	.33	.29	.08	.04 <sup>a</sup>
3. Alcohol Problem	2217			—	.18	.09	.19	.38	.21	.15	.04 <sup>a</sup>	.04 <sup>a</sup>
4. Depression	2222				—	.24	.30	.16	.50	.27	.15	.01 <sup>a</sup>
Provider Assessment												
5. Relationship Problem	2231					—	.15	.22	.24	.26	.13	.05*
6. PTSD	2231						—	.22	.40	.29	.09	.02 <sup>a</sup>
7. Alcohol Problem	2231							—	.26	.24	.01 <sup>a</sup>	.03 <sup>a</sup>
8. Depression	2231								—	.28	.21	.01 <sup>a</sup>
9. Anger Problem	2231									—	.16	.01 <sup>a</sup>
10. Suicidal Ideation	2231										—	-.02 <sup>a</sup>
11. Deployment Group	2231											—

Note. <sup>a</sup> not significantly correlated, \*  $p$  value < .05, all other correlations are significant at the .01 level, two-tailed.

### *Analysis of Variance*

The independent variable (deployment group) and dependent variables (relationship problem, PTSD, alcohol problem, depression, anger problem, and suicidal ideation) were used to compute a one-way analysis of variance (ANOVA); Table 7 shows the results. As predicted, mental health varies with deployment group. Concerns identified by the provider (relationship problem and PTSD) reached the specified .05 significance level,  $F(2, 2228) = 3.79$ ,  $p = .02$  and,  $F(2, 2228) = 3.65$ ,  $p = .03$  respectively. The Tukey honestly significant difference test revealed



that for PTSD the never deployed and deployed once groups were statistically different. There was no difference between the deployed once and deployed more than once groups or the never deployed and deployed more than once groups. For relationship problem, the never deployed group was different from both deployed groups. The deployed once and deployed more than once groups were not significantly different.

Table 7

*Summary Statistics and Comparison of Provider Assessment across Deployment Groups: ANOVA*

Provider Assessment	Deployment Group (N =2231)						Comparison Across Deployment Groups	
	Never (n=167)		Once (n=1498)		More Than Once (n=566)			
	M	SD	M	SD	M	SD	F	p
Relationship Problem	.03	.20	.11	.40	.12	.43	3.79*	.02
PTSD	.01	.16	.09	.36	.08	.34	3.65*	.03
Alcohol Problem	.02	.17	.03	.20	.04	.22	.95	.39
Depression	.07	.30	.12	.40	.11	.39	.93	.40
Anger Problem	.04	.25	.08	.34	.07	.30	1.04	.36
Suicidal Ideation	.02	.17	.01	.12	.01	.07	.78	.47

Note. *F* statistic based on 2 degrees of freedom (*df*) \**p* < .05.

## Discussion

The results of this study indicate that there are differences in the mental health of service members among the deployment groups. A difference was significant among the deployment groups for relationship problem and PTSD. Deployment was also correlated with rank and personal health status.

The difference in self-reported health status among the never deployed group and deployed groups is noteworthy. The never deployed group was more likely than the deployed groups to indicate an excellent or very good personal health status. Although the never deployed group was also more likely than the deployed groups to indicate being physically injured, the difference was not statistically significant. Conversely, the deployed groups were more likely to indicate a poor personal health status and to have more than five health care visits. Personal health status was also significantly correlated with gender, rank, health care visits, being physically injured, relationship problem, PTSD, alcohol problem, and depression.

Further, the deployed groups' report of poor personal health status represents another interesting finding that may be related to mental health. The literature (Marlowe, 2001; Iowa Persian Gulf Study Group, 1997) suggests a link between physical health and mental health. Additionally, the literature proposed a link between the undiagnosed illnesses experienced by service members following the Gulf War and unresolved mental health needs. The report of poor personal health status of the deployed groups may represent an increase in physical illness that may later develop into mental illness or vice versa. Marlowe (2001) and the Iowa Persian Gulf Study Group (1997) found a correlation of stress and physical illness among veterans of the Persian Gulf War. Furthermore, Marlowe (2001) believed that physical and psychological responses interact with each other, serving as both cause and effect. This finding may indicate

that there are service members who are not screening positive for mental health needs when in fact they are in need of care. Left untreated, a war syndrome associated with service in Operation Iraqi Freedom is possible, leading to long term illness.

Although not all the findings were statistically significant, service members who have deployed were more likely to screen positive on the soldiers' survey for relationship problem, PTSD, alcohol problem, and depression than service members who have not deployed. The soldiers' survey produced a percentage of positive results for PTSD (18%) consistent with Hoge et al. (2004). The percentage of PTSD or acute stress reaction was 17.1% in the Hoge et al. (2004) study, 15.2% in the Operation Iraqi Freedom Mental Health Advisory Team Report (2003) and, 10% in the Operation Iraqi Freedom Mental Health Advisory Team Report (2005). Service members in this study had a higher positive screening result for depression (11% to 15%) than in previous studies. The Hoge et al. (2004), Operation Iraqi Freedom Mental Health Advisory Team Report (2003), and Operation Iraqi Freedom Mental Health Advisory Team Report (2005) studies reported a rate of 5% to 7% for depression.

Of most interest were the correlations noted with the soldiers' survey and provider assessment. The rate of depression (11% to 15%) in this study is concerning given the correlation among the variables associated with the dimensions of mental health (relationship problem, PTSD, alcohol problem, depression, anger problem and suicidal ideation). A positive screen for depression on the soldiers' survey was highly correlated ( $p < .01$ , two tailed) with the provider assessment of a relationship problem, PTSD, an alcohol problem, an anger problem, and suicidal ideation. The most significant correlations with depression were for a relationship problem, PTSD, and an anger problem.



On the soldiers' survey, relationship problem, PTSD, alcohol problem, and depression were correlated. A relationship problem was most correlated with the PTSD symptom, feeling numb, and depression. The PTSD symptoms (nightmares, avoid situations, startle/ on guard, and felt numb) were highly correlated. Service members who screened positive for the PTSD symptom of avoiding situations also screened positive for the depression symptom- feeling down. Of the dimensions of mental health, depression correlated most highly with personal health status. Service members who screened positive for depression were more likely to indicate a fair or poor personal health status.

Relationship problem, PTSD, alcohol problem, depression, and anger were also highly correlated on the provider assessment. Suicidal ideation was correlated with relationship problem, PTSD, depression and anger; however, it was not correlated with an alcohol problem. The most significant correlation with suicidal ideation was depression.

There was a significant correlation between relationship problem on the soldiers' survey and suicidal ideation found during the provider assessment. This may be an indication of the significant impact interpersonal relationships have on the mental health of service members. This is not new; the importance of unit cohesion, a key relationship indicator in combat units, has been noted throughout history for its impact on the mental health of service members (Gal & Jones, 1995; Jones, 1995; Helmus & Glenn, 2005).

Historical evidence suggests that deployment has a much greater effect on mental health than the results of this study show. One plausible explanation is the method used to calculate the provider assessment. Combining the categories (minor and major) and coding as positive or negative for a concern identified by the provider may more accurately reflect the differences among the groups. This study utilizes three categories (none, minor, and major) as opposed to

combining them. Because there were three groups, ANOVA was the preferred statistical method for analysis of the data. This leads to a second explanation for the differences between historical data and the data generated in this study. ANOVA assumes that the groups compared are randomly sampled, that the dependent variable is normally distributed, and that the populations from which the groups are drawn have equal variances (Polit, 1996). This study's data did not lend itself to random sampling. The 2,054 survey participants comprising the deployed groups represent approximately 20% of the service members who were eligible to complete the PDHRA process during the study timeframe. Approximately 80% of the service members who redeployed did not complete the PDHRA process and were not included. These service members were not assessed for various reasons. The service member may have exited the service, retired, moved to another duty station, or deployed. The unit the service member was assigned may not have participated in the PDHRA because of a lack of emphasis or a conflict with other training and duty assignments. Additionally, soldiers completed the PDHRA in groups by unit affiliation, complicating the ability to randomly sample. Furthermore, the survey participants may not have been representative of the population. For example, the intensity of combat varied depending on the location and mission of the unit. If a majority of the units experienced low intensity combat, or if a majority experienced high intensity combat, the reported effect of deployment on the mental health of service members may have been different. This is a potential source of variation from previous studies and a potential limiting factor.

Other limitations of this study are inherent in the population studied and the use of a survey. The results can not be generalized to other populations because a variety of factors about a deployment are unknown and unmeasured. Results from the mental health advisory team studies (Operation Iraqi Freedom Mental Health Advisory Team Report, 2003; Operation Iraqi



Freedom-II Mental Health Advisory Team Report, 2005) suggest a negative stigma associated with mental health issues is high in military populations, which may prevent service members from seeking care or answering screening questions truthfully. Leadership buy-in is important to the study results. Ensuring service members complete health assessments may have a low priority compared to other duties. Additionally, the personnel turnover in units and the number of deployments may prevent screening from occurring. For example, some military units were deployed for Hurricanes Katrina and Rita relief within 120 days after returning from Operation Iraqi Freedom.

Factors influencing the motivation of participants include competing activities, perceived importance of the topic, disliking the interviewer or topic, and fear of consequences of participation. More than 98% of the service members completing the PDHRA to date have answered all questions, decreasing the chance of non-response error. However, response errors may have occurred. Because of a negative stigma, service members may not accurately answer screening questions, resulting in participant-initiated error. Interviewer error may occur if the provider fails to gain the cooperation of the participant, is inconsistent, or has a negative attitude. Additionally, the age, gender, qualifications, tone of voice, and other physical attributes of the interviewer may cause bias (Cooper & Schindler, 2003).

In addition to the potential bias of the participants and providers, the sample can affect the study results. The sample may have been biased due to the demographic composition of the groups. The group that has never deployed had a higher percentage of services members in the lowest rank categories than the groups that deployed. Seventy percent of the never deployed group was in the ranks of E1 through E4, although this group represented 44% of the total survey participants. Lack of experience and lower rank were found to be indicators for stress by



researchers and are listed as risk factors in the *Leaders Manual for Combat Stress Control* (Field Manual No. 22-51). The large percentage of lower ranking service members in the never deployed group may have skewed the results. Because the sample was not stratified, the effect this population had on the results is unknown. For example, if service members in the rank of E1 through E4 were more likely to screen positive for depression regardless of deployment status, then a large percentage of this population in the never deployed group may make the differences among the three groups more subtle.

### Conclusion

The soldiers' survey and the provider assessment found co-morbidity of the dimensions of mental health. Relationship problem, PTSD, alcohol problem, depression, anger problem and suicidal ideation seem to be interrelated. This association may serve as a cause and effect or play a role in the intensity of mental and physical illness. The correlation of the dimensions of mental health, rank, and self-reported personal health status should be explored.

Although deployment was a significant link to mental health needs, it may have a greater impact than this study demonstrates. The sample may not have been representative of the population because of sampling error, bias of participants and/or providers, and unknown deployment factors such as combat intensity.

Implications for policy, treatment, and resources cannot be determined based only on one study. Historical literature shows that research can have an impact on the mental health of service members and can contribute to policy. Diligence in identifying changes in the mental health of service members will contribute to early recognition and treatment. One way to accomplish this is to link data for analysis from all survey forms, health assessments, and military units. Linking data will assist researchers in identifying risk factors for mental health

conditions that are not contained within a single form. Changes in the mental health of military populations should be identified and studied since it is unlikely that a single factor such as deployment will impact each individual service member in the same manner. Accurate data are needed from a variety of sources to identify these changes and the subsequent impact on the military population. A data repository is already established for deployment health data; however, it may not contain all the data needed to conduct research, or the data it contains may not have been collected in a consistent manner.

### Recommendations

Interesting findings that warrant further investigation include the correlation of rank and the dimensions of mental health (relationship problem, PTSD, alcohol problem, depression, anger problem, and suicidal ideation); the correlation of personal health status and the dimensions of mental health; and the co-morbidity of the dimensions of mental health. Additionally, a study of the long term effects of the intensity of combat and the type of combat experienced on the mental health of service members would add to the current body of research.

Rank may have a stronger association with mental health outcomes than deployment alone. Research on the exact nature of the link may prove useful for identifying populations most at risk for developing mental health problems. Furthermore, targeting lower ranking service members with mental health programs may reduce barriers to care such as the negative stigma associated with seeking care for mental health. In addition to reducing barriers to seeking care for mental health, targeting this population provides an early opportunity for education about the appropriate treatment of combat stress, the normal emotions experienced during the transition from combatant to civilian, and appropriate coping mechanisms.

Further research is recommended to explore the association of self-reported personal health status as well as the co-morbidity of mental health problems. A long term study on the cause and effect between physical health and mental health will be important to future research and policy. Understanding the characteristics of the connection between physical and mental health will impact medical practice. If the two are in fact associated, the future of medical practice may incorporate a more holistic (body, mind and spirit) philosophy. Additionally, a long term study to research the co-morbidity of mental health problems will add to existing literature. A study of the interrelation of mental health problems may help impact treatment and policy.

Finally, research is recommended to determine the impact of different types of combat on mental health outcomes. This study population experienced force-on-force combat in which the enemy was identifiable and the situation was more predictable. The combat experience in Iraq has changed to an insurgency type in which the enemy is difficult to identify and the fluid situation is unpredictable. Moreover, it would be interesting to compare these results to the future PDHRA survey results of the 4<sup>th</sup> Infantry Division to ascertain differences in mental health for service members involved in different types of combat.



## Appendix A

## Post-deployment Health Reassessment Survey DD Form 2900



## POST-DEPLOYMENT HEALTH REASSESSMENT (PDHRA)

Authority: 10 U.S.C. 136 Chapter 55, 1074f, 3013, 5013, 8013 and E.O. 9397

**Principal Purpose:** To assess your state of health after deployment in support of military operations and to assist military healthcare providers, including behavioral health providers, in identifying present and future medical care needs you may have. The information you provide may result in a referral for additional healthcare that may include behavioral healthcare.

**Routine Use:** To other Federal and State agencies and civilian healthcare providers as necessary in order to provide necessary medical care and treatment. Responses may be used to guide possible referrals.

**Disclosure:** Disclosure is voluntary.

**INSTRUCTIONS:** Please read each question completely and carefully before making your selections. Provide a response for each question. If you do not understand a question, ask the administrator. Please respond based on your MOST RECENT DEPLOYMENT.

## Demographics

Last Name

First Name

MI

Date arrived theater (mm/yyyy)

Date departed theater (mm/yyyy)

Today's Date (dd/mm/yyyy)

DOB (dd/mm/yyyy)

Social Security Number

Gender

- ☐ Male  
☐ Female

Service Branch

- ☐ Air Force  
☐ Army  
☐ Navy  
☐ Marine Corps  
☐ Coast Guard  
☐ Other

Status Prior to Deployment

- ☐ Active Duty  
☐ Selected Reserves - Reserve - Unit  
☐ Selected Reserves - Reserve - AGR  
☐ Selected Reserves - Reserve - IMA  
☐ Selected Reserves - National Guard - Unit  
☐ Selected Reserves - National Guard - AGR  
☐ Ready Reserves - IRR  
☐ Ready Reserves - ING  
☐ Civilian Government Employee  
☐ Other

Pay Grade

- ☐ E1 ☐ O01 ☐ W1  
☐ E2 ☐ O02 ☐ W2  
☐ E3 ☐ O03 ☐ W3  
☐ E4 ☐ O04 ☐ W4  
☐ E5 ☐ O05 ☐ W5  
☐ E6 ☐ O06  
☐ E7 ☐ O07 ☐ Other  
☐ E8 ☐ O08  
☐ E9 ☐ O09  
☐ O10

Marital Status

- ☐ Never Married  
☐ Married  
☐ Separated  
☐ Divorced  
☐ Widowed

Location of Operation

- ☐ Iraq ☐ South America  
☐ Afghanistan ☐ North America  
☐ Kuwait ☐ Australia  
☐ Qatar ☐ Europe  
☐ Bosnia/Kosovo ☐ On a ship  
☐ SW Asia - other ☐ Other:  
☐ Africa

Since return from deployment I have:

- ☐ Maintained/returned to previous status  
☐ Transitioned to Selected Reserves:  
☐ Transitioned to Ready Reserves:  
☐ Retired from Military Service  
☐ Separated from Military Service

Current Contact Information:

Phone: \_\_\_\_\_  
Cell: \_\_\_\_\_  
DSN: \_\_\_\_\_  
Email: \_\_\_\_\_  
Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Total Deployments in Past 5 Years:

- |                                 |                                 |                                 |
|---------------------------------|---------------------------------|---------------------------------|
| OIF                             | OEF                             | Other                           |
| <input type="radio"/> 1         | <input type="radio"/> 1         | <input type="radio"/> 1         |
| <input type="radio"/> 2         | <input type="radio"/> 2         | <input type="radio"/> 2         |
| <input type="radio"/> 3         | <input type="radio"/> 3         | <input type="radio"/> 3         |
| <input type="radio"/> 4         | <input type="radio"/> 4         | <input type="radio"/> 4         |
| <input type="radio"/> 5 or more | <input type="radio"/> 5 or more | <input type="radio"/> 5 or more |

Current Unit of Assignment

Current Assignment Location



Point of Contact who can always reach you:

Name: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Reset

33348

1. Overall, how would you rate your health during the PAST MONTH?  
☐ Excellent      ☐ Very Good      ☐ Good      ☐ Fair      ☐ Poor
2. Compared to before your most recent deployment, how would you rate your health in general now?  
☐ Much better now than before I deployed  
☐ Somewhat better now than before I deployed  
☐ About the same as before I deployed  
☐ Somewhat worse now than before I deployed  
☐ Much worse now than before I deployed
3. Since you returned from deployment, about how many times have you seen a healthcare provider for any reason, such as in sick call, emergency room, primary care, family doctor, or mental health provider?  
☐ No visits      ☐ 1 visit      ☐ 2-3 visits      ☐ 4-5 visits      ☐ Over 6 visits
4. Since you returned from deployment, have you been hospitalized?      ☐ Yes      ☐ No
5. During your deployment, were you wounded, injured, assaulted or otherwise physically hurt?      ☐ Yes      ☐ No  
**If NO, skip to Question 6.**
- 5a. **IF YES**, are you still having problems related to this wound, assault, or injury?      ☐ Yes      ☐ No      ☐ Unsure
6. Other than wounds or injuries, do you currently have a health concern or condition that you feel is related to your deployment?      ☐ Yes      ☐ No      ☐ Unsure  
**If NO, skip to Question 7.**
- 6a. **IF YES**, please mark the item(s) that best describe your deployment-related condition or concern:
- |   |   |
|---|---|
| <input type="radio"/> Chronic cough                         | <input type="radio"/> Redness of eyes with tearing                            |
| <input type="radio"/> Runny nose                            | <input type="radio"/> Dimming of vision, like the lights were going out       |
| <input type="radio"/> Fever                                 | <input type="radio"/> Chest pain or pressure                                  |
| <input type="radio"/> Weakness                              | <input type="radio"/> Dizziness, fainting, light headedness                   |
| <input type="radio"/> Headaches                             | <input type="radio"/> Difficulty breathing                                    |
| <input type="radio"/> Swollen, stiff or painful joints      | <input type="radio"/> Diarrhea, vomiting, or frequent indigestion             |
| <input type="radio"/> Back pain                             | <input type="radio"/> Problems sleeping or still feeling tired after sleeping |
| <input type="radio"/> Muscle aches                          | <input type="radio"/> Difficulty remembering                                  |
| <input type="radio"/> Numbness or tingling in hands or feet | <input type="radio"/> Increased irritability                                  |
| <input type="radio"/> Skin diseases or rashes               | <input type="radio"/> Taking more risks such as driving faster                |
| <input type="radio"/> Ringing of the ears                   | <input type="radio"/> Other: _____  |
7. Do you have any persistent major concerns regarding the health effects of something you believe you may have been exposed to or encountered while deployed?      ☐ Yes      ☐ No  
**If NO, skip to Question 8.**
- 7a. **IF YES**, please mark the item(s) that best describe your concern:
- |  |  |
|--|--|
| <input type="radio"/> DEET insect repellent applied to skin        | <input type="radio"/> Paints                             |
| <input type="radio"/> Pesticide-treated uniforms                   | <input type="radio"/> Radiation                          |
| <input type="radio"/> Environmental pesticides (like area fogging) | <input type="radio"/> Radar/microwaves                   |
| <input type="radio"/> Flea or tick collars                         | <input type="radio"/> Lasers                             |
| <input type="radio"/> Pesticide strips                             | <input type="radio"/> Loud noises                        |
| <input type="radio"/> Smoke from oil fire                          | <input type="radio"/> Excessive vibration                |
| <input type="radio"/> Smoke from burning trash or feces            | <input type="radio"/> Industrial pollution               |
| <input type="radio"/> Vehicle or truck exhaust fumes               | <input type="radio"/> Sand/dust                          |
| <input type="radio"/> Tent heater smoke                            | <input type="radio"/> Blast or motor vehicle accident    |
| <input type="radio"/> JP8 or other fuels                           | <input type="radio"/> Depleted Uranium (if yes, explain) |
| <input type="radio"/> Fog oils (smoke screen)                      | <input type="radio"/> Other: _____                       |
| <input type="radio"/> Solvents                                     |  |



8. Since return from your deployment, have you had serious conflicts with your spouse, family members, close friends, or at work that continue to cause you worry or concern? ☐ Yes ☐ No ☐ Unsure
9. Have you had any experience that was so frightening, horrible, or upsetting that, IN THE PAST MONTH, you ....
- a. Have had any nightmares about it or thought about it when you did not want to ☐ Yes ☐ No
  - b. Tried hard not to think about it or went out of your way to avoid situations that remind you of it ☐ Yes ☐ No
  - c. Were constantly on guard, watchful, or easily startled ☐ Yes ☐ No
  - d. Felt numb or detached from others, activities, or your surroundings ☐ Yes ☐ No
10. a. In the PAST MONTH, did you use alcohol more than you meant to? ☐ Yes ☐ No
- b. In the PAST MONTH, have you felt that you wanted to or needed to cut down on your drinking? ☐ Yes ☐ No
11. Over the PAST MONTH, have you been bothered by the following problems?
- |  | Not at all            | Few or several days   | More than half the days | Nearly every day      |
|--|-----------------------|-----------------------|-------------------------|-----------------------|
| a. Little interest or pleasure in doing things | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>   | <input type="radio"/> |
| b. Feeling down, depressed, or hopeless        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>   | <input type="radio"/> |
12. If you checked off any problems or concerns on this questionnaire, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?
- ☐ Not difficult at all ☐ Somewhat difficult ☐ Very difficult ☐ Extremely difficult
13. Would you like to schedule a visit with a healthcare provider to further discuss your health concern(s)? ☐ Yes ☐ No
14. Are you currently interested in receiving information or assistance for a stress, emotional or alcohol concern? ☐ Yes ☐ No
15. Are you currently interested in receiving assistance for a family or relationship concern? ☐ Yes ☐ No
16. Would you like to schedule a visit with a chaplain or a community support counselor? ☐ Yes ☐ No



**Health Care Provider Only**

SERVICE MEMBER'S SOCIAL SECURITY #

--	--	--	--	--	--	--	--	--	--

DATE (dd/mm/yyyy)

--	--	--	--	--	--	--	--	--	--

**Provider Review and Interview**

1. Review symptoms and deployment concerns identified on form:

- ☐ Confirmed screening results as reported      ☐ Screening results modified, amended, clarified during interview:

2. Ask behavioral risk questions.

a. Over the PAST MONTH, have you been bothered by thoughts that you would be better off dead or of hurting yourself in some way? ☐ Yes ☐ No

IF YES, about how often have you been bothered by these thoughts? ☐ Very few days ☐ More than half of the time ☐ Nearly every day

b. Since return from your deployment, have you had thoughts or concerns that you might hurt or lose control with someone? ☐ Yes ☐ No ☐ Unsure

3. IF YES OR UNSURE to behavioral risk questions, conduct risk assessment.

- a. Does member pose a current risk for harm to self or others? ☐ No, not a current risk ☐ Yes, poses a current risk ☐ Unsure, referred
- b. Outcome of assessment ☐ Immediate referral ☐ Routine follow-up referral ☐ Referral not indicated

4. Record additional questions or concerns identified by patient during interview:

**Assessment and Referral:** After my interview with the service member and review of this form, there is a need for further evaluation and follow-up as indicated below. (More than one may be noted for patients with multiple concerns.)

5. Identified Concerns

Minor Concern

Major Concern

Already Under Care

Yes

No

- ☐ Physical Symptom
- ☐ Exposure Concern
- ☐ Depression Symptoms
- ☐ PTSD Symptoms
- ☐ Anger/Aggression
- ☐ Suicidal Ideation
- ☐ Social/Family Conflict
- ☐ Alcohol Use
- ☐ Other: \_\_\_\_\_
- ☐ None

<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>

<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>

<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>

<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>

6. Referral Information

- ☐ a. No referral made
- ☐ b. Immediate/emergent care
- ☐ c. Primary Care, Family Practice
- ☐ d. Specialty Care: \_\_\_\_\_
- ☐ e. Behavioral Health in Primary Care
- ☐ f. Mental Health Specialty Care
- ☐ g. Case Manager, Care Manager
- ☐ h. Substance Abuse Program
- ☐ i. Health Promotion, Health Education
- ☐ j. Other Healthcare Service
- ☐ k. Chaplain
- ☐ l. Family Support, Community Service
- ☐ m. Military OneSource
- ☐ n. Other: \_\_\_\_\_

7. Comments:

8. Provider

a. Name (Last, First) \_\_\_\_\_

b. Signature and stamp: \_\_\_\_\_

ICD-9 Code for this  
visit: V70.5\_6

**Ancillary Staff/Administrative Section**

9. Member was provided the following:

- ☐ Health Education and Information
- ☐ Health Care Benefits and Resources Information
- ☐ Appointment Assistance
- ☐ Service member declined to complete form
- ☐ Service member declined to complete interview/assessment
- ☐ Service member declined referral for services
- ☐ Other: \_\_\_\_\_

10. Referral made to the following healthcare or support system:

- ☐ Military Treatment Facility
- ☐ Division/Line-Based Medical Resource
- ☐ VA Medical Center or Community Clinic
- ☐ Vet Center
- ☐ TRICARE Provider
- ☐ Contract Support: \_\_\_\_\_
- ☐ Community Service: \_\_\_\_\_
- ☐ Other: \_\_\_\_\_
- ☐ None

## Appendix B

### Provider Interview Instructions

#### Overview/Purpose

- Process is voluntary, except in cases of safety (that is, suicidal and homicidal thinking/behavior and domestic violence)
- Provide soldiers with an opportunity to report physical and mental health concerns in supportive setting
- Identify and address health concerns that have emerged after deployment
- Provide soldier with an offer of referral to appropriate resources to address their concerns

#### Interview procedure/format

- Review soldier's responses to items on PDHRA
- Validate and/or briefly explore reported symptoms and counsel soldier on benefits of seeking treatment for identified condition
- Refer physical concerns to appropriate resources (usually PCM)
- Consider asking if symptoms interfere with normal, pre-deployment functioning in work, personal, leisure arenas
- Refer mental health concerns to on-site Care Managers for further exploration and counseling
- Mental health conditions reflected in Questions 6a (esp right column), 8, 9, 10, 11, 14 (DD Form 2900-Soldier's Report)
- If question 8 positive, inquire about safety of spouse, children, coworkers, and homicidal thoughts (DD Form 2900-Soldier's Report)
- Refer alcohol use issues (question 10) to the Army Substance Abuse Program (ASAP)
- Refer soldiers with immediate safety concerns via "today" consult to appropriate mental health clinic for safety assessment – also refer to unit leadership for escort

- NOTE: 1CD and 4ID soldiers are referred to FHR&R Center (specific instructions and/or MEPRS codes to follow). III Corps, 13<sup>th</sup> COSCOM, Reserve and National Guard soldiers are referred to Thomas Moore Psychology Service (TMPS)

### Important issues

- Soldiers may be unwilling or unable to verbalize concerns to the clinician because of:
  - fear of receiving an unfavorable reaction or unreliable response
  - fear of reprisal or non-supportive behavior by their units
  - distrust of the Government and government personnel
- Soldiers may express concerns as a request or offer additional complaints that clarify their true concerns
- Soldiers without symptoms may want to discuss deployment related health concerns.
- Effective communication regarding highly personal concerns is primarily determined by the soldier's assessment of the clinician's credibility and trustworthiness
- Perceptions of clinician trustworthiness and credibility are based on:
  - Caring and empathy
  - Competence and expertise
  - Dedication and commitment
  - Honesty and openness
- Establish a partnership with the soldier, by:
  - acknowledging the soldier's concerns and symptoms
  - indicating your commitment to understand the soldier's concern and symptoms
  - encouraging open and honest transfer of information
  - indicating commitment to provide sufficient time and resources to resolving the soldier's concerns
  - avoiding open skepticism or disapproving comments in discussing the soldier's concerns
  - asking if there are unaddressed or unresolved concerns
- Pay special attention to nonverbal cues that denote the soldier's true feelings, such as posture, eye contact, facial expressions, and indirect language (e.g., "thousand yard stare" or haunted look) - addressing nonverbal cues is valuable to ultimately understanding and communicating with the soldier
- Our understanding of health outcomes after deployment is limited - some symptoms may not yet be obvious or may not yet have manifested



## Appendix C

## Variables, Measures, and Coding of Data

<b>VARIBLE &amp; SPSS CODE</b>	<b>DESCRIPTION</b>			<b>SPSS DATA CODE</b>
<b>Gender</b>	Male Female			FEMALE=0, MALE=1
<b>Pay Grade/ Rank</b>	E1 E2 E3 E4 E5 E6 E7 E8 E9	O1 O2 O3 O4 O5 O6 O7 O8 O9 O10	W1 W2 W3 W4 W5	E1-E4= 1 E5-E6= 2 E7-E9= 3 W1-W5= 4 O1-O3= 5 O4-O10= 6
<b>Personal Health Status</b>	Question 1 "Overall , how would you rate your health during the PAST MONTH?"			Excellent=1 Very Good= 2 Good= 3 Fair= 4 Poor= 5
<b>Health Care Visits</b>	Question 3 "Since you returned from deployment, about how many times have you seen a healthcare provider for any reason, such as in sick call, emergency room, primary care, family doctor, or mental health provider?" Phrased: <i>In the past month.....</i> for non-deployed.			No visits= 0 1 visit= 1 2-3 visits= 2 4-5 visits= 3 over 5 visits= 4
<b>Physically Injured</b>	Question 5 "During your deployment, were you wounded, injured, assaulted or otherwise physically hurt?" Phrased: <i>In the past month.....</i> for non-deployed			Yes= 1 No= 0
<b>Relationship</b>	Question 8 "Since return from your deployment, have you had serious conflicts with you spouse, family members, close friends, or at work that continue to cause you worry or concern?" Phrased: <i>In the past month.....</i> for non-deployed Yes or unsure is coded positive, no is coded negative			Positive= 1 Negative= 0
<b>PTSD</b>	Question 9 "Have you had any experience that was so frightening, horrible, or upsetting that, IN THE PAST MONTH, you....." Coded as positive for the selection of two symptoms ("yes" to two parts)			Positive= 1 Negative= 0

## Appendix C continued

## Variables, Measures, and Coding of Data

<b><i>VARIABLE &amp; SPSS CODE</i></b>	<b><i>DESCRIPTION</i></b>	<b><i>SPSS DATA CODE</i></b>
<b>Nightmares</b>	Question 9a. "Have had any nightmares about it or thought about it when you did not want to"	Yes= 1 No= 0
<b>Avoid situations</b>	Question 9b. "Have tried hard not to think about it or went out of your way to avoid situations that remind you of it"	Yes= 1 No= 0
<b>Startle/ On Guard</b>	Question 9c. "Were constantly on guard, watchful, or easily started"	Yes= 1 No= 0
<b>Felt Numb</b>	Question 9d. "Felt numb or detached from others, activities, or your surroundings"	Yes= 1 No= 0
<b>Alcohol</b>	Positive is the selection of yes to both parts of question 10. Negative is the selection of no to one or both parts of question 10.	Positive= 1 Negative= 0
<b>Drink more than intended</b>	Question 10a. "In the PAST MONTH, did you use alcohol more than you meant to?"	Yes= 1 No= 0
<b>Felt need to cut down</b>	Question 10b. "In the PAST MONTH, have you felt that you wanted to or needed to cut down on your dinking?"	Yes= 1 No= 0
<b>Depression</b>	Question 11: "Over the PAST MONTH, have you been bothered by the following problems?" Positive is the selection of "More than half the days" or "Nearly every day" to one or both parts of question 11.	Positive= 1 Negative= 0
<b>Little Interest</b>	Question 11a. "Little interest or pleasure in doing things"	Not at all= 0 Few or several days= 1 More than half the days= 2 Nearly every day= 3
<b>Feeling Down</b>	Question 11b. "Feeling down, depressed, or hopeless"	Not at all= 0 Few or several days= 1 More than half the days= 2 Nearly every day= 3
<b>Relationship Concern PTSD Concern Alcohol Concern Anger Concern Suicidal Concern</b>	Item 5 on Health Care Provider Section of DD Form 2900. Minor Concern Major Concern	Not selected= 0 Minor concern= 1 Major concern = 2
<b>Deployment Group</b>	Calculated from demographics section of DD Form 2900. "Location of Operation = Iraq and total deployments in past 5 years.	Never deployed= 0 Deployed once = 1 Deployed more than once=2



## References

- Assistant Secretary of Defense for Health Affairs Memorandum, "Policy for Pre- and Post-Deployment Health Assessments and Blood Samples," 25 October 1999 (HA Policy 99-002)
- Assistant Secretary of Defense for Health Affairs Memorandum, "Updated Policy for Pre- and Post-Deployment Health Assessments and Blood Samples," 25 October 2001 (HA Policy 01-017)
- Assistant Secretary of Defense for Health Affairs Memorandum, "Realignment of the Comprehensive Clinical Evaluation Program (CCEP), Transition to the DoD Deployment Health Clinical Center (DHCC)," 14 January 2002
- Assistant Secretary of Defense for Health Affairs Memorandum, "Post-Deployment Health Reassessment (PDHRA)," 10 March 2005 (HA Policy 05-011)
- Army Posture Statement (2005). *Our Army at War- Relevant and Ready...Today and Tomorrow*. Resources retrieved 20 February, 2006 from <http://www.army.mil/aps/>
- Army Posture Statement (2006). *A Campaign Quality Army with Joint and Expeditionary Capabilities*. Resources retrieved 20 February, 2006 from <http://www.army.mil/aps/>
- Bliese, P., Wright, K., Adler, A., & Thomas, J. (2004). Validation of the 90 to 120 day post-deployment psychological short screen. *U.S. Army Research Unit-Europe, Walter Reed Army Institute of Research Report #2004-002*.
- Bliese, P., Wright, K., Adler, A., Hoge, C., & Thomas, J. (2005). Post-Deployment Psychological Screening: Interpreting and Scoring DD Form 2900. *U.S. Army Research Unit-Europe, Walter Reed Army Institute of Research Report #2005-003*.
- Brown, R., Leonard, T., Saunders, L., & Papsouliotis, O. (2001). A two-time conjoint screen for alcohol and other drug problems. *Journal of American Board of Family Practice* 14, 95-106.
- Cooper, D.R., & Schindler, P.S. (2003). *Business research methods* (Rev.ed.). New York, NY: McGraw-Hill Companies
- Deployment Health Clinical Center. Resources retrieved 18 August, 2005 from <http://www.pdhealth.mil/>
- Department of Defense Instruction 6490.3 "Implementation and Application of Joint Medical Surveillance for Deployments," 7 August, 1997
- Farley, D., Vernez, G., Peiklik, S., & Curry, S. (2002). *Implementing the Post-Deployment Health Practice Guideline: Lessons from the Field Demonstration*. Arlington, VA: Rand Corporation, Arroyo Center, Center for Military Health Policy Research.



- Gal, R., & Jones, F. (1995). A Psychological Model of Combat Stress. In Jones, F., Sparacino, L., Wilcox, V., Rothberg, J., Stokes, J., (1995). *War Psychiatry* (pp. 133-148). Washington D.C.: Borden Institute.
- Hoge, C., Castro, C., Messer, S., McGurk, D., Cotting, D., & Koffman, R. (2004). Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *The New England Journal of Medicine* 351(1), 13-22.
- Helmus, T., & Glenn, R., (2005). *Steeling the Mind. Combat Stress Reactions and Their Implications for Urban Warfare*. Arlington, VA: Rand Corporation
- Iowa Persian Gulf Study Group (1997) Self-reported illness and Health Status Among Gulf War Veterans. A Population – Based Study. *Journal of the American Medical Association* 277, 238-245.
- Joint Chiefs of Staff Memorandum, “Updated Procedures for Deployment Health Surveillance and Readiness,” 1 February 2002 (MCM-0006-02)
- Jones, F., Sparacino, L., Wilcox, V., Rothberg, J., Stokes, J. (1995). *War Psychiatry*. Washington D.C.: Borden Institute.
- Kang, H., & Hyams, K. (2005). Mental health care needs among recent war veterans. *The New England Journal of Medicine* 352(13), 1289.
- Kirkland, F. (1995). PostCombat Reentry. In Jones, F., Sparacino, L., Wilcox, V., Rothberg, J., Stokes, J., (1995). *War Psychiatry* (pp. 291-317). Washington D.C.: Borden Institute.
- Leaders Manual for Combat Stress Control, Field Manual No. 22-51, Headquarters Department of the Army, Washington, DC, 29 September 1994.
- Management of Major Depressive Disorder in Adults in the Primary Care Setting. Washington, DC: VA/DoD Evidence Based Clinical Practice Guideline Working Group, Veterans Health Administration, Department of Veterans Affairs, and Health Affairs, Department of Defense, May 2000. . Office of Quality and Performance publication 10Q-CPG/MDD-00.
- Management of Post-Traumatic Stress. Washington, DC: VA/DoD Clinical Practice Guideline Working Group, Veterans Health Administration, Department of Veterans Affairs and Health Affairs, Department of Defense, December 2003. Office of Quality and Performance publication 10Q-CPG/PTSD-04.
- Management of Substance Use Disorder in the Primary Care Setting. Washington, DC: VA/DoD Evidence-Based Clinical Practice Guideline Working Group, Veterans Health Administration, Department of Veterans Affairs, and Health Affairs, Department of Defense, September 2001. Office of Quality and Performance publication 10Q-CPG/SUD-01.
- Marlowe, D., (2001). *Psychological and Psychosocial Consequences of Combat and Deployment*

*with Special Emphasis on the Gulf War* (Document no MR-1019/11-0JD). Arlington, VA: Rand Corporation

Operation Iraqi Freedom (OIF) Mental Health Advisory Team (MHAT) Report. (2003)

Retrieved 18 August 2005, from <http://www.globalsecurity.org/military/library/report/2004/mhat.htm>

Operation Iraqi Freedom (OIF-II) Mental Health Advisory Team (MHAT-II) Report. (2005)

Retrieved 18 August 2005, from [http://www.armymedicine.army.mil/news/mhat\\_ii/mhat.cfm](http://www.armymedicine.army.mil/news/mhat_ii/mhat.cfm)

Office of the Surgeon General/Medical Command Policy Memo 06-005, "OTSG/MEDCOM Implementation Plan for Active Component Post-Deployment Health Reassessment Program (PDHRA)," 7 March 2006.

Polit, D.F. (1996). *Data analysis & statistics for nursing research*. Upper Saddle River, NJ: Prentice Hall.

Post-Deployment Health Evaluation and Management Clinical Practice Guideline.

Washington, DC: VA/DoD Clinical Practice Guideline Working Group, Veterans Health Administration, Department of Veterans Affairs and Health Affairs, Department of Defense, December 2001. Office of Quality and Performance publication 10Q-CPG/PTSD-04.

Prins, A., Kimerling, R., & Leskin, G. (2005). PTSD in Iraq war veterans: implications for primary care. A National Center for PTSD Fact Sheet. Retrieved 25 September 2005, from <http://www.ncptsd.va.gov>

Under Secretary of Defense Memorandum, "Enhanced Post-Deployment Health Assessments," 22 April 2003

United States Marine Corps Leaders Guide to Managing Marines in Distress. Resources retrieved on 10 December 2005 from

<http://www.usmc-mccs.org/LeardersGuide/Deployments/CombatOpsStress>

Van Weel, C., Konig, C., Zahn, , Touw-Otten, F., Van Duijn, N., Meyboom- de Jong, B. Measuring functional health status with the COOP/WONCA Charts. World Organization of Family Doctors (WONCA), the European Research Group on Health Outcomes (ERGHO), the Northern Centre for Health Care Research (NCH), University of Groningen, The Netherlands, (ISBN 90 72156 33 1) 1995.



REPORT DOCUMENTATION PAGE					Form Approved OMB No. 0704-0188	
<p>The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</p> <p><b>PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.</b></p>						
1. REPORT DATE (DD-MM-YYYY) 06-07-2006		2. REPORT TYPE Final Report		3. DATES COVERED (From - To) July 2005 to July 2006		
4. TITLE AND SUBTITLE Effects of Deployment on the Mental Health of Service Members at Fort Hood				5a. CONTRACT NUMBER		
				5b. GRANT NUMBER		
				5c. PROGRAM ELEMENT NUMBER		
				5d. PROJECT NUMBER		
6. AUTHOR(S) Dickinson, Carla, M., MAJ, AN				5e. TASK NUMBER		
				5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Carl R. Darnall Army Medical Center 36000 Darnall Loop Fort Hood, TX				8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) US Army Medical Department Center and School BLDG 2841 MCCS-HFB (Army-Baylor Program in Healthcare Administration) 3151 Scott Road, Suite 1411 Fort Sam Houston, TX 78234-6135				10. SPONSOR/MONITOR'S ACRONYM(S)		
				11. SPONSOR/MONITOR'S REPORT NUMBER(S) 15-06		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited						
13. SUPPLEMENTARY NOTES						
14. ABSTRACT <p>A factor in the Army's ability to perform its mission is the continuous supply of forces ready for deployment. The impact deployment has on the mental health of service members affects the policy and the resources needed for mental and behavioral health. The need exists for establishing a baseline to help implement appropriate policy, to improve treatment, and to quantify the resources needed for mental health. The objective of this research is to determine if a significant correlation exists between deployment and the outcome of a provider assessment for mental health. Data collected from the Post-Deployment Health Reassessment (DD Form 2900) were used to compare three deployment groups: never deployed (n=167), deployed once (n=1,498), and deployed more than once (n=566). Comparisons were made with regard to the mental health screening dimensions of relationship problem, PTSD, alcohol problem, depression, anger problem, and suicidal ideation. Statistical analysis confirms that a significant difference exists for relationship problem <math>F(2, 2228) = 3.79, p = .02</math> and PTSD <math>F(2, 2228) = 3.65, p = .03</math>.</p>						
15. SUBJECT TERMS Post-Deployment Health Reassessment, PDHRA, PTSD, deployment health, mental health						
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT  SAR	18. NUMBER OF PAGES  86	19a. NAME OF RESPONSIBLE PERSON	
a. REPORT  U	b. ABSTRACT  U	c. THIS PAGE  U			Education Technician	
					19b. TELEPHONE NUMBER (Include area code) (210) 221-6443	